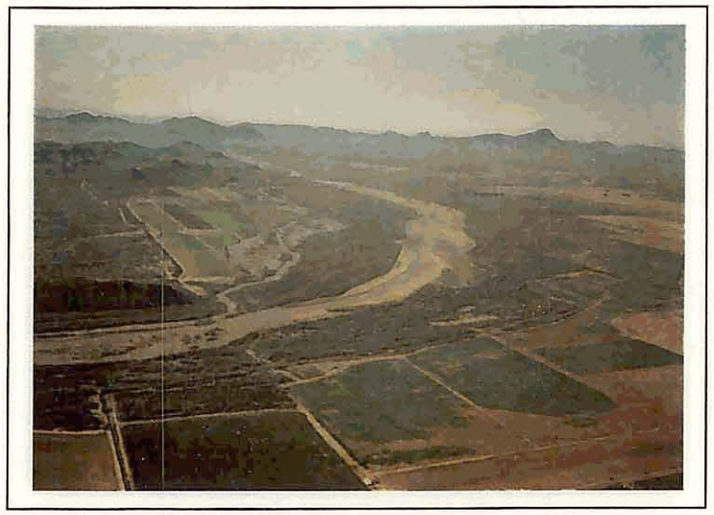

"n" VALUE REPORT

SALT AND GILA RIVERS FLOOD INSURANCE STUDY

FCD 92-01

Registered Professional Engineer
CERTIFICATE NO. 11557
TIMOTHY E. KELLY
Date signed 7/11/94
ARIZONA, U.S.A.

Submitted to:
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
July, 1994

Baker
Michael Baker Jr., Inc.

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"n" Value Report

SALT AND GILA RIVERS

FLOOD INSURANCE STUDY

FCD 92-01

Submitted to:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2801 West Durango Street
Phoenix, Arizona 85009

Submitted by:

MICHAEL BAKER JR., INC.
1313 East Osborn Road, Suite 150
Phoenix, Arizona 85014
(602) 279-1234

July, 1994

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I. INTRODUCTION

This report was prepared by Michael Baker, Jr. Inc., as part of the Flood Insurance Study (FIS) of the Salt and Gila Rivers (Contract No. FCD 92-01, Phase II) for the Flood Control District of Maricopa County. The study limits of the Salt and Gila Rivers are from Gillespie Dam on the Gila River, to Granite Reef Dam on the Salt River, extending approximately 71 miles. Figure 1 includes a site map showing the study limits.

The purpose of this report is to present the results of a detailed analysis which defines Manning's roughness coefficients for the Salt and Gila Rivers and intends to provide supplementary technical documentation for the development of a detailed hydraulic model.

II. METHODOLOGY

Values for Manning's roughness coefficient, "n", are assigned for conditions that exist at the time of a specific flow event, for average conditions over a range in stage, or for anticipated conditions at the time of some future flow event. The Manning's "n" values developed in this study for the Salt and Gila Rivers FIS were developed for the 100-year peak flood discharges.

Several sources of data were utilized to develop the "n" values presented in this report. The information available included: 1) aerial photo contact prints (McLain Harbers Co. Inc., January 1991 and January 1993); 2) ground level photographs; 3) video tape of the study reach; 4) 1"=400', 4' contour interval mapping; and 5) HEC-2 cross-sections. The ground level photographs and video tape were obtained on field reconnaissance trips conducted April 9, 1992, November 18, 1992, May 6, 1993, and June 16, 1993. Photos obtained from a project flight on March 12, 1992, were also available.

The "n" values assigned to a stream reach should represent the factors that tend to impede flow. Manning's roughness coefficients were derived by assigning a base "n" (n_b) value that represents the surface roughness for a straight, uniform channel or overbank region composed of a given bed material (1). Vegetation, channel shape and irregularity, stage, discharge, and other factors that increase roughness were accounted for by adding increments of roughness to n_b.

Two procedures were used to integrate the "n" values into the detailed hydraulic model (HEC-2). The first procedure ("NC" cards) assigns "n" values to channel and overbank areas of a typical cross section representing a stream reach of uniform roughness characteristics. This procedure was utilized throughout the river's channelized portion from approximately 27th Avenue to McClintock Drive. The second procedure ("NH" cards) assigns "n" values to a specific cross section. The cross sections are horizontally subdivided into segments of uniform roughness. The hydraulic model (HEC-2) then computes the average "n" value for the specific section (2). This procedure was utilized from Gillespie Dam, upstream to approximately 27th Avenue, and for most of the reach from just east of McClintock Drive to Granite Reef Dam. Within these reaches, defining the cross section "n" values only by channel, left overbank and right overbank regions was insufficient to adequately describe the lateral roughness variation created by the multiple channels, vegetation areas and overbank conditions.

The Salt and Gila Rivers have sand bed channels that transport significant sediment load during flow events. The channel bed form is a function of flow velocity, grain size and other variables. The base "n" values developed for sand bed channels assume the natural channel to be in the upper flow regime. If the natural channel is in the lower or transitional flow regime, the base "n" value will be much larger as a result of the bed form roughness. Therefore, the flow regime was estimated for representative reaches to confirm the applicability of the base "n" values.

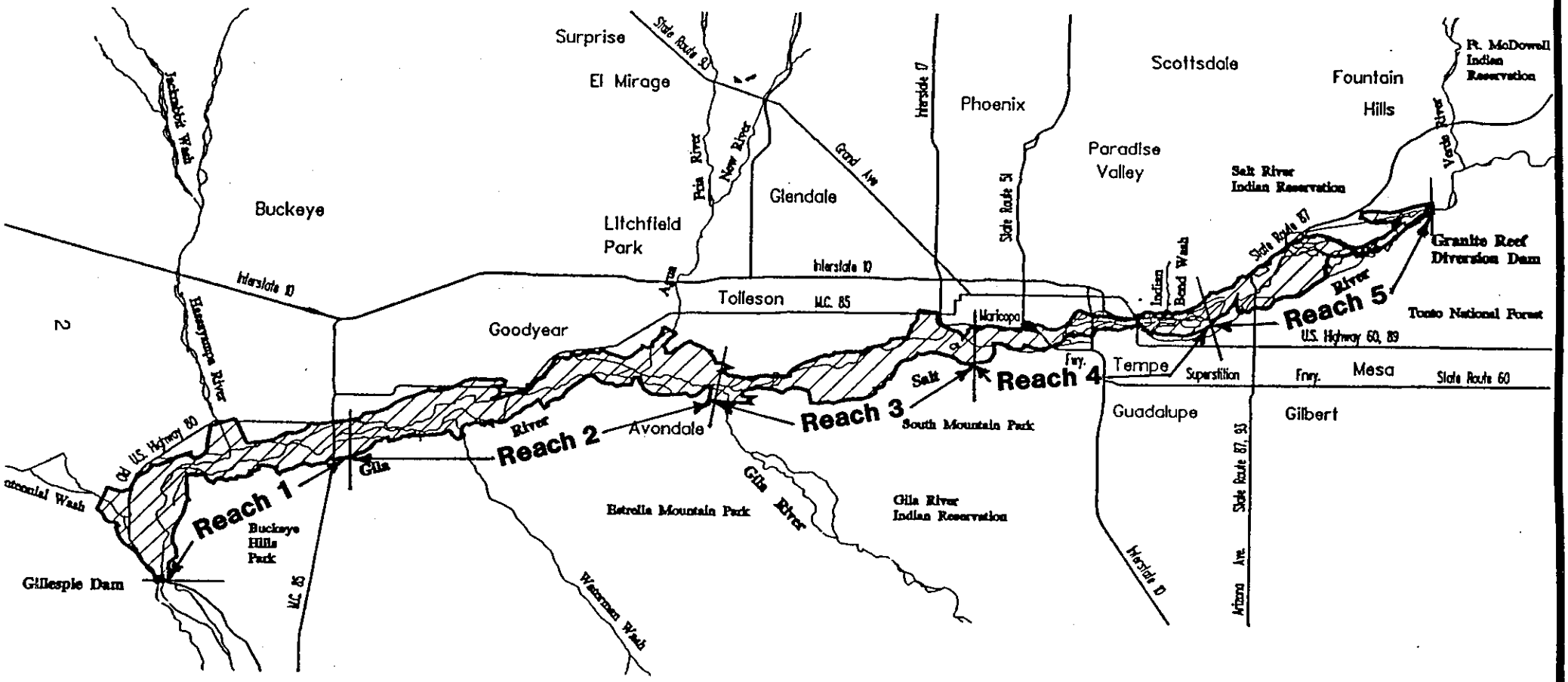

FIGURE 1 - Salt/Gila FIS Location Map

NOT TO SCALE

Baker

Michael B[illegible] Inc

III. BASE "n" VALUE DETERMINATION

The base "n" values used in this study generally apply to average conditions rather than the smoothest reach attainable for a given bed material (3). The base "n" value for the Salt and Gila Rivers, in the main channel, was assigned for flood flows represented by sand channels with moveable beds. Photograph 1A illustrates typical bed material found in the main channel of the lower reaches of the river. The bed material is characterized as medium to coarse grain sand. Close examination of the bed material photographs indicates a representative base "n" value for the Salt and Gila Rivers would be 0.025. Photograph 1C illustrates typical channel vegetation in the lower reaches. Photograph 1B illustrates typical bed material in the upper reaches of the main channel. The base "n" value was adjusted to 0.028 for the larger size river rock found in the upper reaches.

The base "n" values for the overbanks were assigned considering stable channel conditions (1). Review of photographs of the overbanks provides little evidence of bed material movement except in locations where small channels have formed in the overbank. The bed material is considered "firm soil". Therefore, a base "n" value of 0.025 was assigned to the overbanks for the Salt and Gila Rivers. Photograph 2A and 2B illustrate typical overbank bed material and vegetation characteristics within the study area.

Agricultural fields are located within the overbanks along a significant portion of the study reach. Field reconnaissance indicates that the majority of these fields are planted with cotton. It was assumed, for the purposes of this study, that the 100-year flood would occur during the off-season for cotton at a time when the cotton fields contain little or no vegetation. This assumption was based on the timing of the most recent flooding events which occurred in mid-winter to early spring. A value of 0.025 was selected. Photograph 2C illustrates typical cropland, which are generally cotton fields.

Within the overbanks of some cross-sections, there are residential subdivisions located in the floodplain. In these cases, a special "n" value was calculated to reflect the effect of flow around buildings. Three different housing configurations were considered and "n" values were estimated according to the special "n" value equation (9). See Appendix D for calculations and diagrams.

IV. ADJUSTMENTS TO THE BASE VALUE

The base "n" value (n_b) must be adjusted accordingly for factors such as depth of flow, channel irregularities, obstructions, vegetation, changes in channel shape, and degree of meandering. The method used for this study to arrive at the overall "n" was to add increments of roughness (n_1, n_2, and n_3) to n_b for each condition that increases the roughness(1).

Channel irregularity can have a great impact on the overall "n" when the width-to-depth ratio is small. The width of the main channel of the Salt and Gila Rivers is relatively large in comparison to the depth. Therefore, only minor adjustments were applied to the base "n" value to account for channel irregularity (n_1). Obstructions are physical objects that disturb the flow pattern and increase the "n" value. The amount of increase depends upon the channel slope, shape of the obstruction, the size in relation to the cross section, and the number, arrangement, and spacing of obstructions. Engineering judgment and experience was applied when assigning adjustments to the base "n" value for obstructions so as not to duplicate conditions considered for other adjustment factors. The adjustment for obstructions (n_2) is relatively small throughout the Salt/Gila study reach.

PHOTO 1A - Typical bed material in main channel along lower reaches

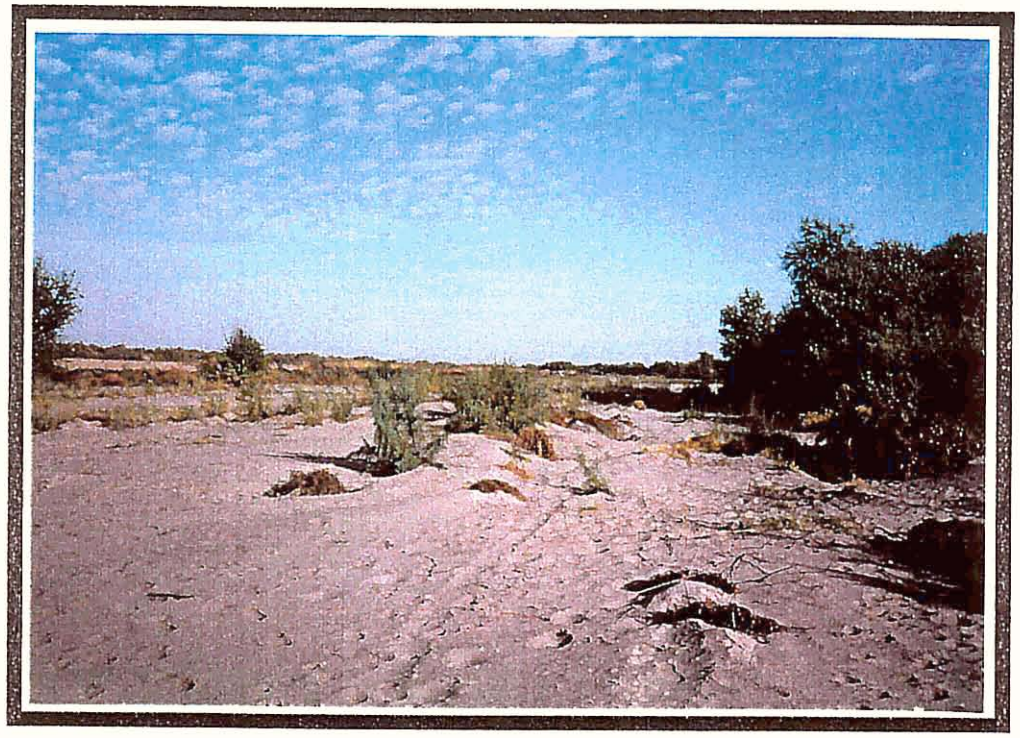

PHOTO 1B - Typical vegetation in main channel along lower reaches

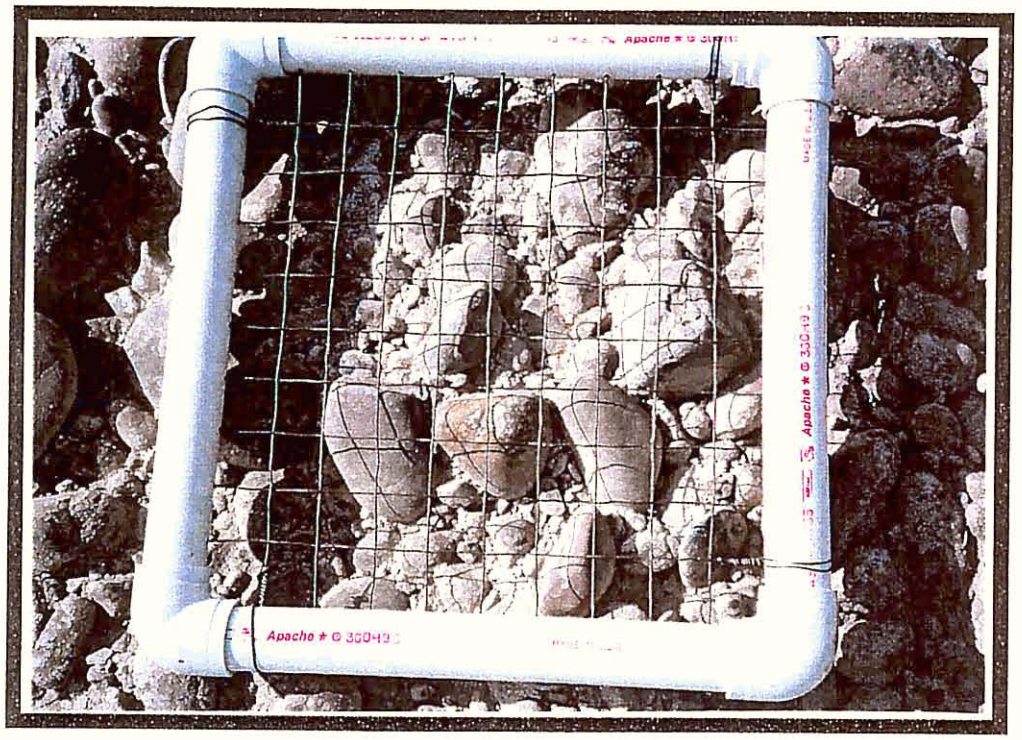

PHOTO 1C - Typical bed material in main channel along upper reaches

PHOTO 2A - Typical dense vegetation in overbanks

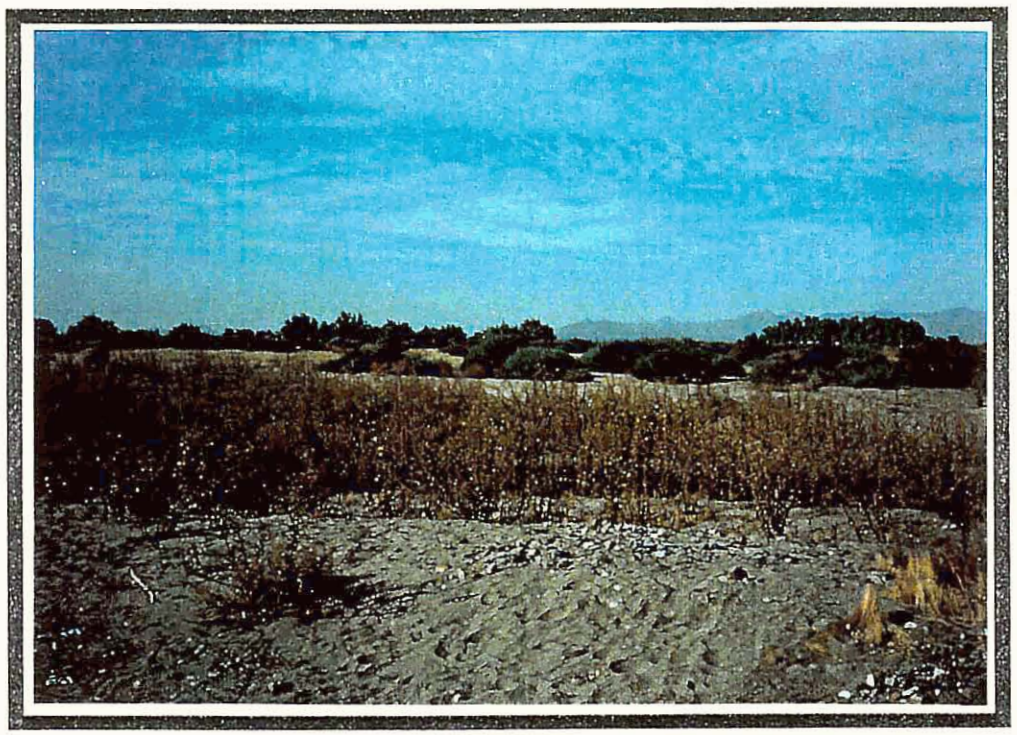

PHOTO 2B - Typical bed material and vegetation in overbanks

PHOTO 2C - Typical cropland in overbanks; generally cotton fields

Several factors impact the extent to which vegetation affects the base "n" values. The percentage of wetted perimeter covered by vegetation, the density of vegetation below the high water line, the degree to which high water flattens the vegetation, and the alignment of vegetation relative to the flow, all impact the value assigned to the vegetation adjustment factor (n_3). Vegetation is the primary factor that affects "n" for the Salt/Gila Rivers. Therefore, vegetation is the basis for assigning "n" values rather than the material in which it is growing for most parts of the channel or flood plains. The density of the vegetation was used to assign "n" values for each cross section. Varying degrees of density of trees, brush and weeds exist throughout the study reach. A large portion of the river has dense growths of trees (e.g., salt cedar) along the banks and overbanks. The levels of density are described as dense, medium-dense, medium, light-medium, light and clear. These descriptions were used throughout the "n" value calculations. See Appendix B.

V. DETAILED ANALYSES

Thirty-three cross sections of the main channel were developed from the Salt/Gila Rivers topographic mapping for the detailed evaluation of typical "n" value characteristics. The representative cross sections were then divided into subsections. Each of these subsections was evaluated in detail to define the "n" value for the subdivided portion of the cross section. In the main channel portion of the cross sections, the "n" value was defined by further subdividing the channel into regions of uniform roughness characteristics and assigning components (n_1, n_2, etc.) of "n" values to each region. A calibration procedure was performed to validate the "n" values determined for this study. See Appendix E for details on this procedure.

Photographs are used to illustrate typical features and characteristics for each of the thirty-three cross sections. The channel and overbank features in the photographs are representative of that particular cross section and for cross sections both upstream and downstream. The cross sections chosen for this report are typical sections intended to represent a large portion of the study reach. Due to the size of the study reach, however, not every type of cross section could be represented.

CROSS SECTION LEGEND

- MAIN CHANNEL LIMIT
- WATER SURFACE
- CONCRETE
- TREE (TYPICALLY SALT CEDAR)
- SHRUBS, GRASS, WEEDS
- CROPLAND (TYPICALLY COTTON)

KEY TO PHOTOGRAPH LOCATION MAP

LETTER	PHOTO # (S)	LOCATION
A	3 - 6	Gillespie Dam
B	7 - 9	N. of Gillespie Dam
C	10 - 13	Downstream of Desert Rose Road
D	14 - 16	Bend in Gila River
E	17 - 19	Downstream from Hassayampa River
F	20 - 23	Confluence with Hassayampa River
G	24 - 26	Palo Verde Road alignment
H	27 - 30	SR 85
J	31 - 33	Upstream of SR 85
K	34 - 37	Airport Road crossing
L	38 - 40	Tuthill Road Bridge
M	41 - 44	Cotton Lane alignment
N	45 - 48	Estrella Parkway Bridge
P	49 - 52	Bullard Avenue Bridge
Q	53 - 56	El Mirage Road crossing
R	57 - 60	115th Avenue crossing
S	61 - 63	91st Avenue crossing
T	64 - 66	67th Avenue crossing
U	67 - 72	51st Avenue Bridge
V	73 - 74	35th Avenue Bridge
W	75 - 77	19th Avenue Bridge
X	78 - 81	7th Avenue Bridge
Y	82 - 84	Central Avenue Bridge
Z	85 - 88	7th Street Bridge
AA	89 - 92	16th Street Bridge
AB	93 - 96	24th Street Bridge
AC	97 - 99	I-10 Bridge
AD	100 - 102	Approx. 32nd Street alignment
AE	103 - 105	Hohokam Expressway Bridge
AF	106 - 109	Approx. Priest Drive alignment
AG	110 - 113	Rural Road Bridge
AH	114 - 116	Approx. Dobson Road alignment
AJ	117 - 119	Alma School Road Bridge
AK	120 - 122	Country Club Road Bridge
AL	123 - 125	Approx. Lehi Road alignment

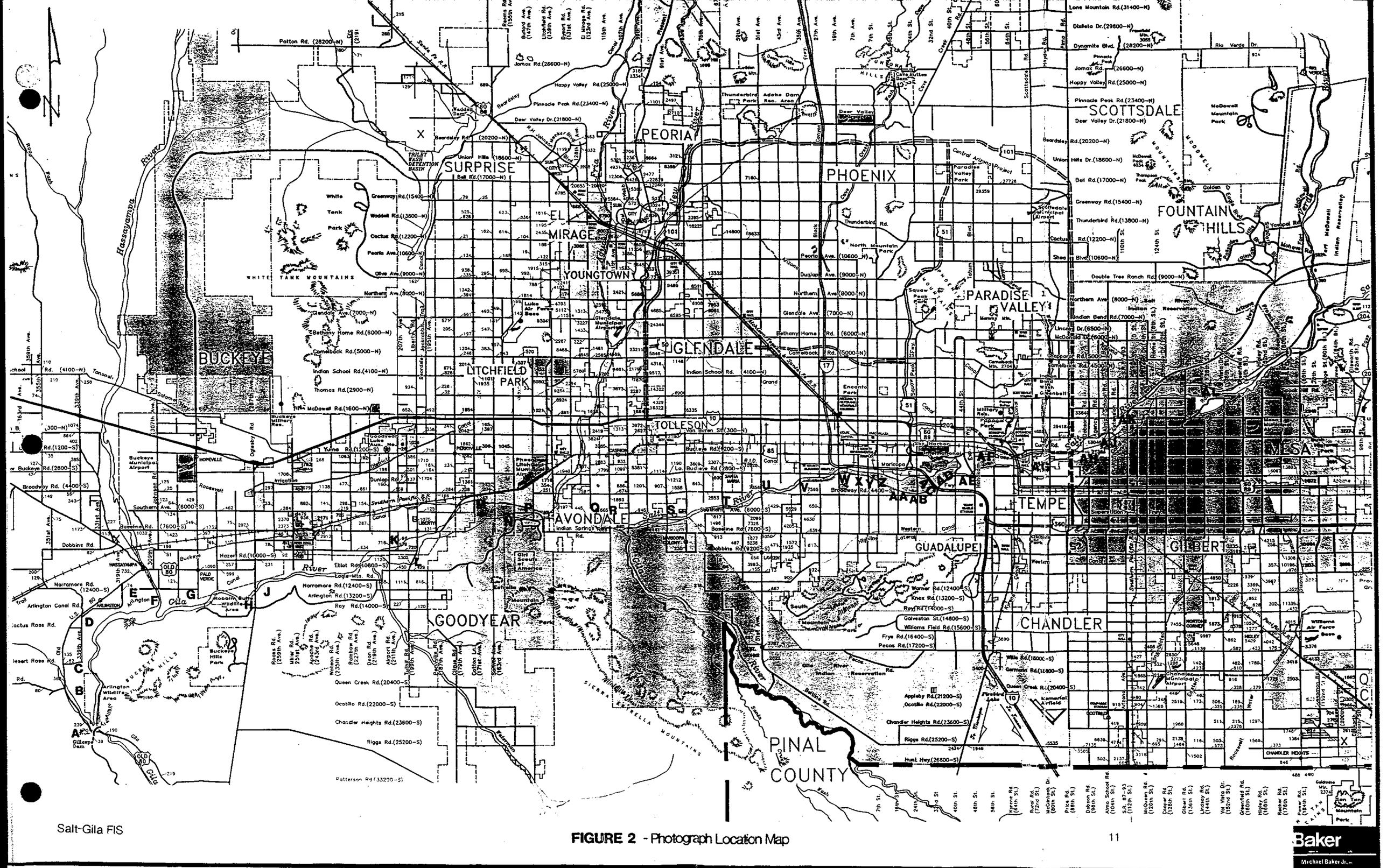

FIGURE 2 - Photograph Location Map

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CROSS-SECTION(S) : 166.57 - 167.23

LOCATION : North (upstream) and south (downstream) of Gillespie Dam; top of Gillespie Dam

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Vegetation ranges from dense salt cedar in overbanks to light or no vegetation in channel. Vegetation varies across cross-section.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	**Components**	**"n" Total**
Dense - Salt cedar typical		**n = 0.150**
Light - Sparse and or small vegetation	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**
Agricultural - Cotton Fields		**n = 0.025**
Concrete - Top of Dam		**n = 0.015**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 166.57

REACH 1

100–YEAR "n" VALUES

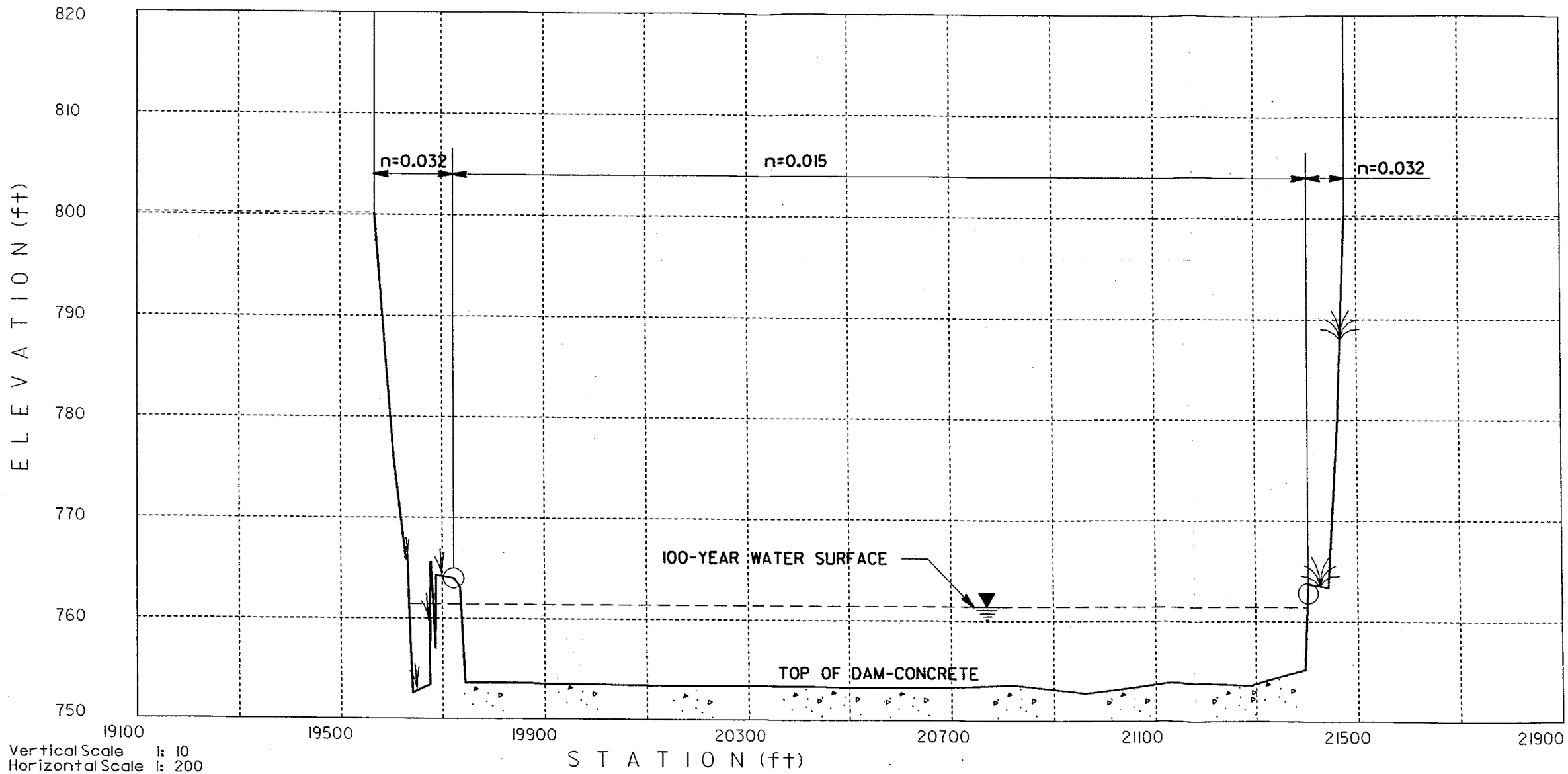

FIGURE 3 – TOP OF GILLESPIE DAM

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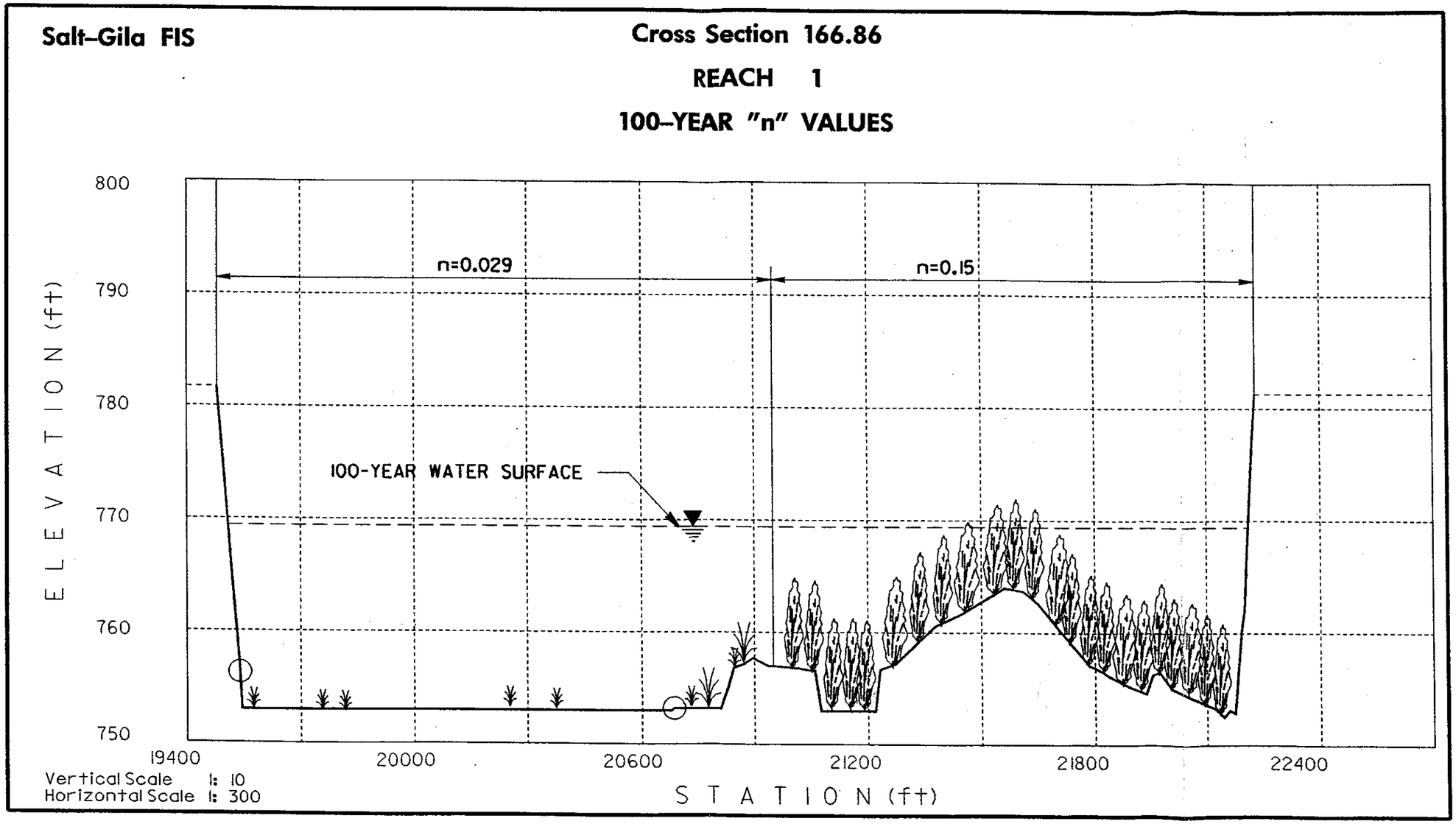

FIGURE 4 – NORTH OF GILLESPIE DAM

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Cross Section 167.23
REACH 1
100–YEAR "n" VALUES

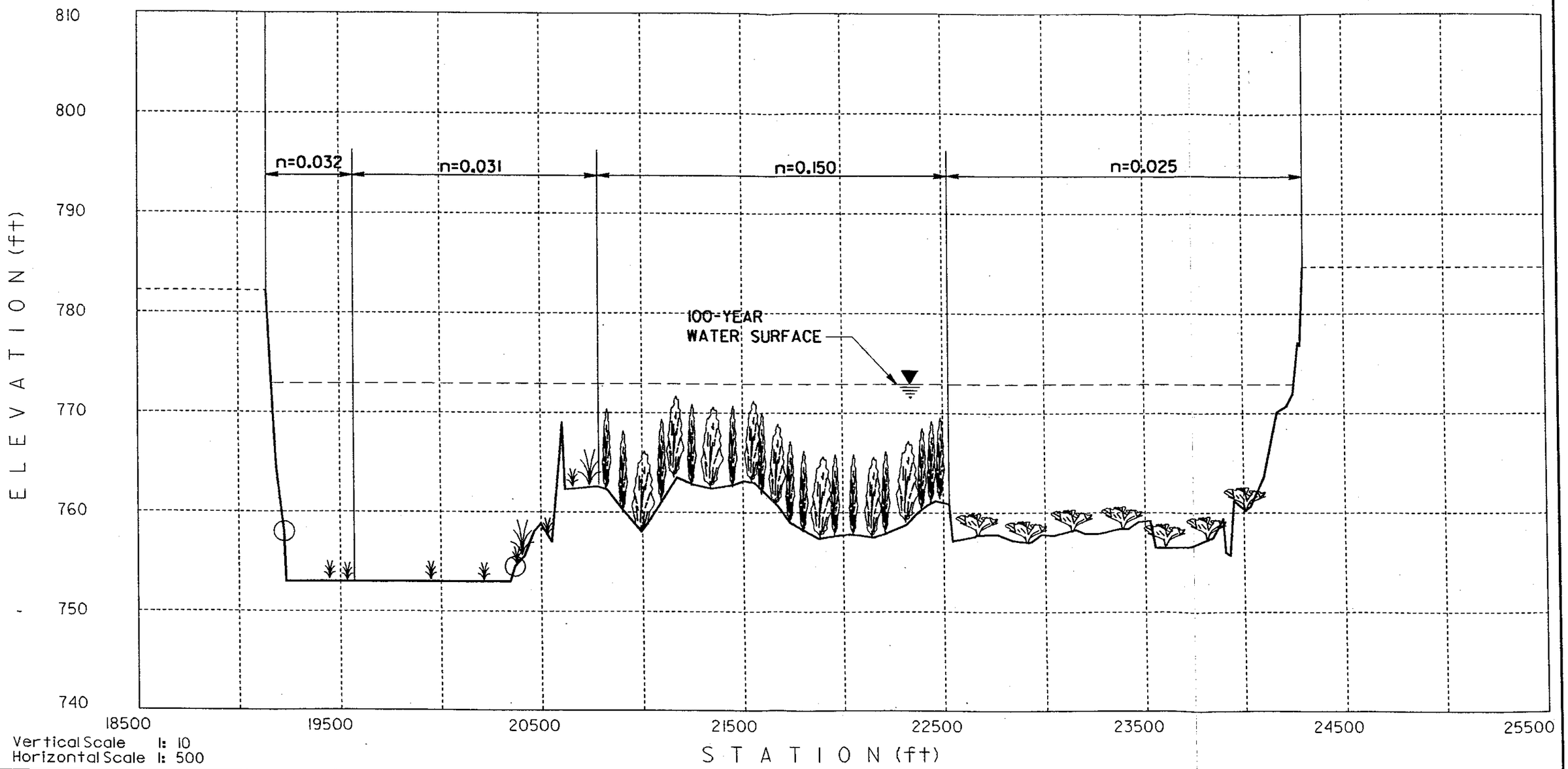

FIGURE 5 – NORTH OF GILLESPIE DAM

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PHOTO 3 - Section 166.57 - Gillespie Dam - Looking E. along dam - Dense vegetation north and south of dam - Clear within main channel with scattered vegetation

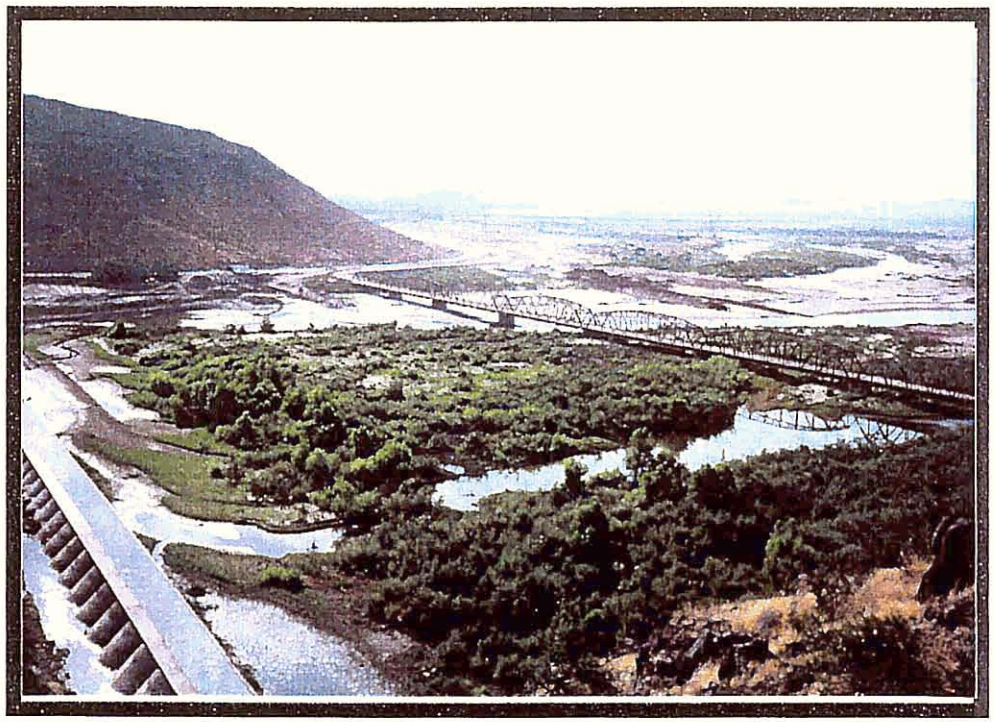

PHOTO 4 - Section 166.49 - Gillespie Dam - Looking S. of Dam across channel - Dense vegetation

PHOTO 5 - Section 166.86 - N. of Gillespie Dam -Looking E. across channel - Dense vegetation in right overbank (foreground)

PHOTO 6 - Section 167.23 - N. of Gillespie Dam - Looking NE across channel - Dense vegetation, salt cedar, in right overbank (foreground) - Channel is clear with scattered vegetation

CROSS-SECTION(S) : 167.90 ±

LOCATION : North (upstream) of Gillespie Dam

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Eroded banks along right overbank. Bed material in channel is primarily sand. Vegetation in channel is light density or clear with some scattered vegetation. Overbank vegetation is dense salt cedar.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Dense - Salt cedar typical		**n = 0.150**
Light-medium - Sparse vegetation with some pockets of thicker vegetation	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.009$	**n = 0.037**
Light - Sparse and/or small vegetation	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 167.90
REACH 1
100–YEAR "n" VALUES

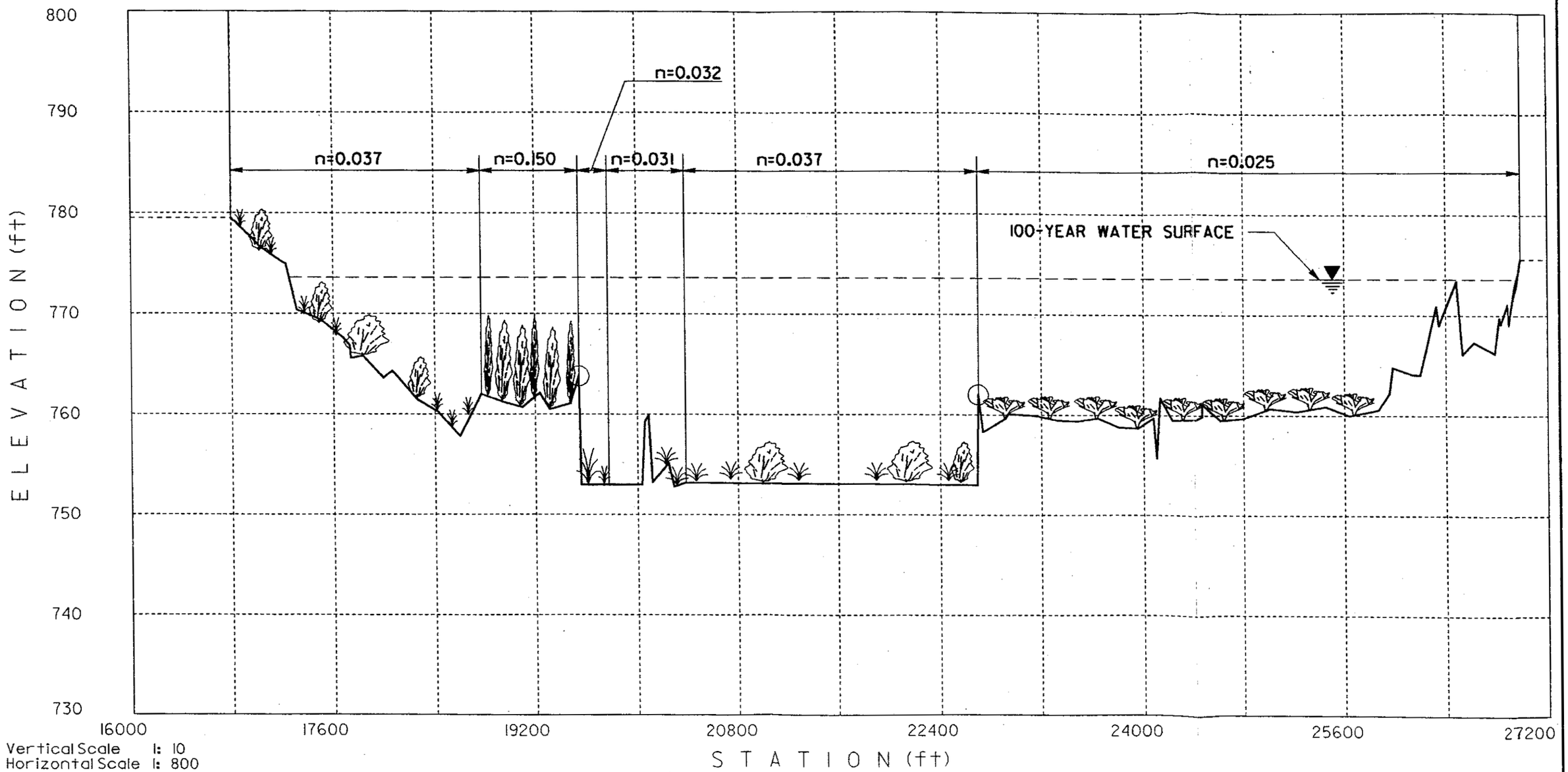

FIGURE 6 – NORTH OF GILLESPIE DAM

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PHOTO 9 - Section 167.90 - N. of Gillespie Dam - Looking E. across channel - Light vegetation in channel

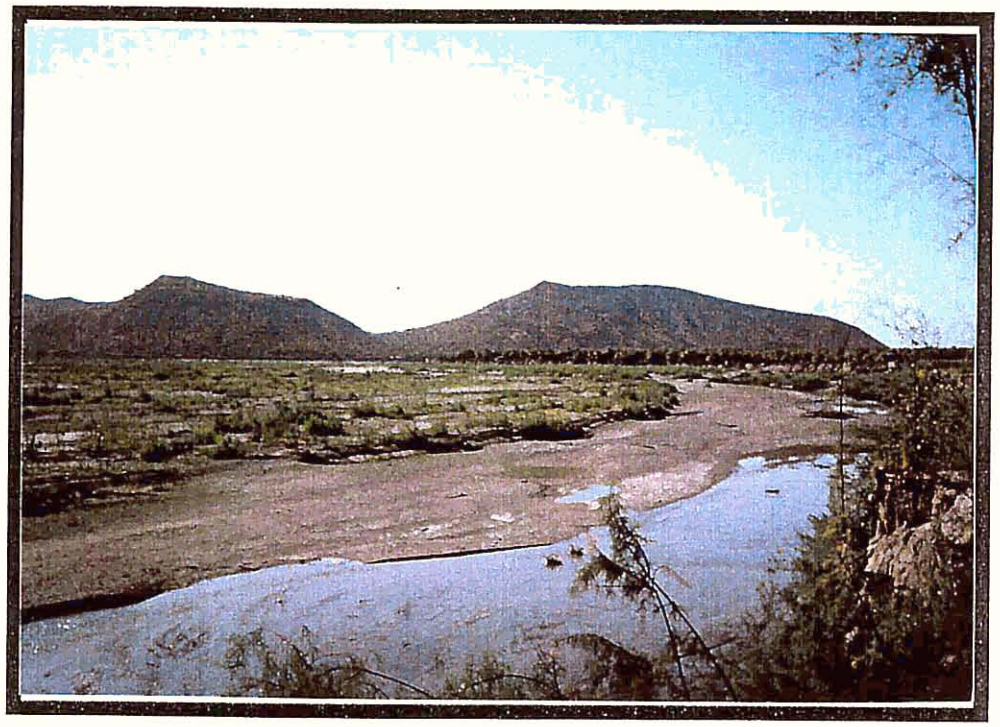


PHOTO 7 - Section 167.90 - N. of Gillespie Dam - Looking SE downstream along channel - Note eroded banks - Light vegetation in channel - Dense vegetation on banks

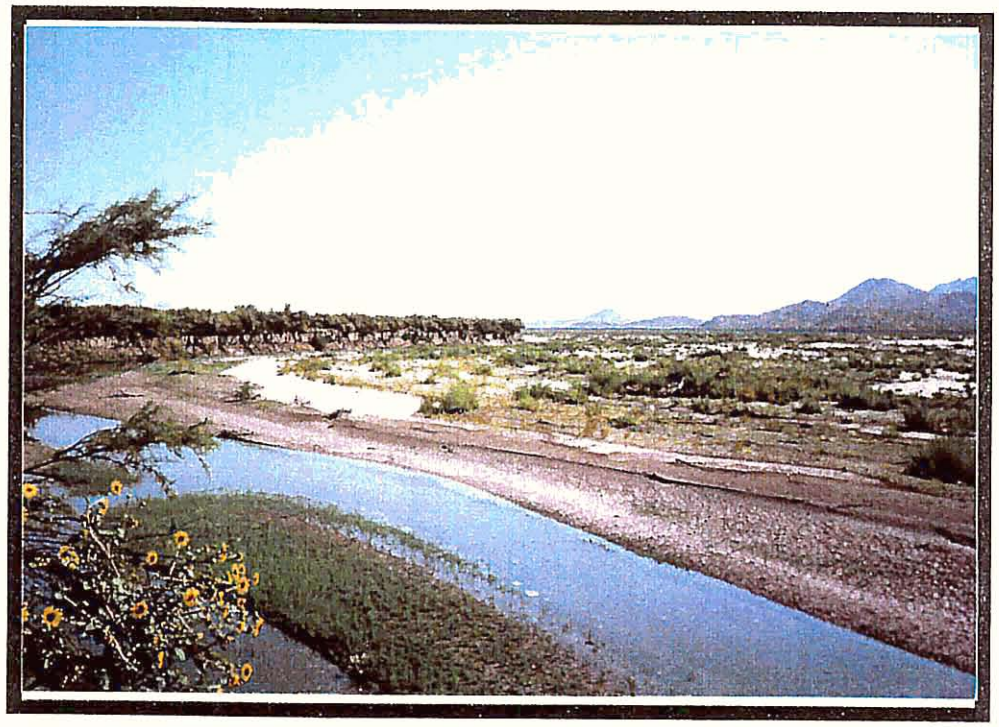


PHOTO 8 - Section 167.90 - N. of Gillespie Dam - Looking NE upstream along channel - Note eroded banks - Light vegetation in channel - Dense vegetation on banks

CROSS-SECTION(S) : 169.55 ±

LOCATION : *North of Gillespie Dam; downstream of Desert Rose Road*

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Eroded banks along right overbank. Bed material in channel is primarily sand and river rock along banks. Vegetation in channel is light density or clear with some scattered vegetation. Overbank vegetation is predominantly dense salt cedar. Some areas are cleared agricultural fields.

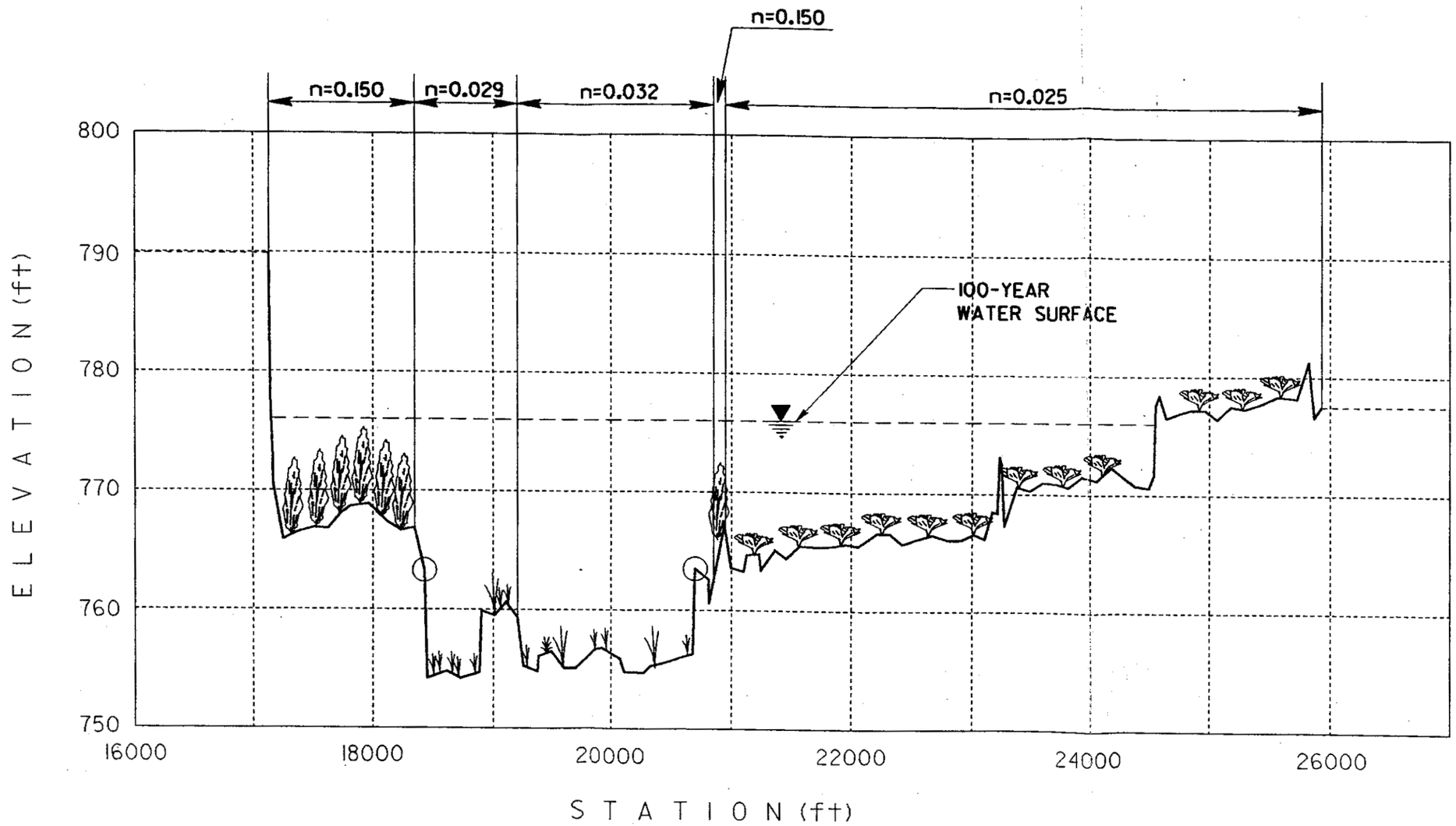
100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	**Components**	**"n" Total**
Dense - Salt cedar typical		**n = 0.150**
Light - Sparse and/or small vegetation	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 169.55

REACH 1

100–YEAR "n" VALUES



Vertical Scale 1: 10

Horizontal Scale 1: 1000

FIGURE 7 – NORTH OF GILLESPIE DAM

Baker
Michael Baker Jr., Inc.

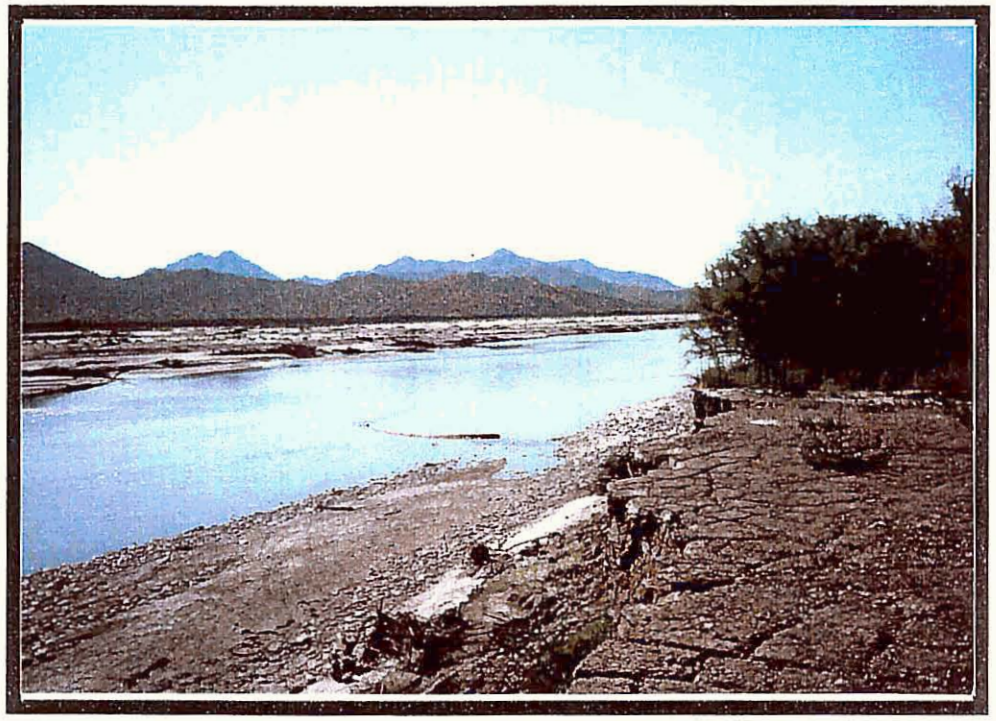


PHOTO 10 - Section 169.55 - Downstream of Desert Rose Rd. - Looking SE downstream along channel - Eroded banks - Dense vegetation in overbanks

PHOTO 11 - Section 169.55 - Downstream of Desert Rose Rd. - Looking E. across channel - Channel is clear with some light vegetation - Dense vegetation in left overbank - Right overbank is clear field with scattered vegetation

PHOTO 12 - Section 169.55 - Downstream of Desert Rose Rd. - Looking upstream along channel - Channel is clear with some scattered, light vegetation within channel - Dense vegetation in left overbank - Right overbank is clear field with scattered vegetation

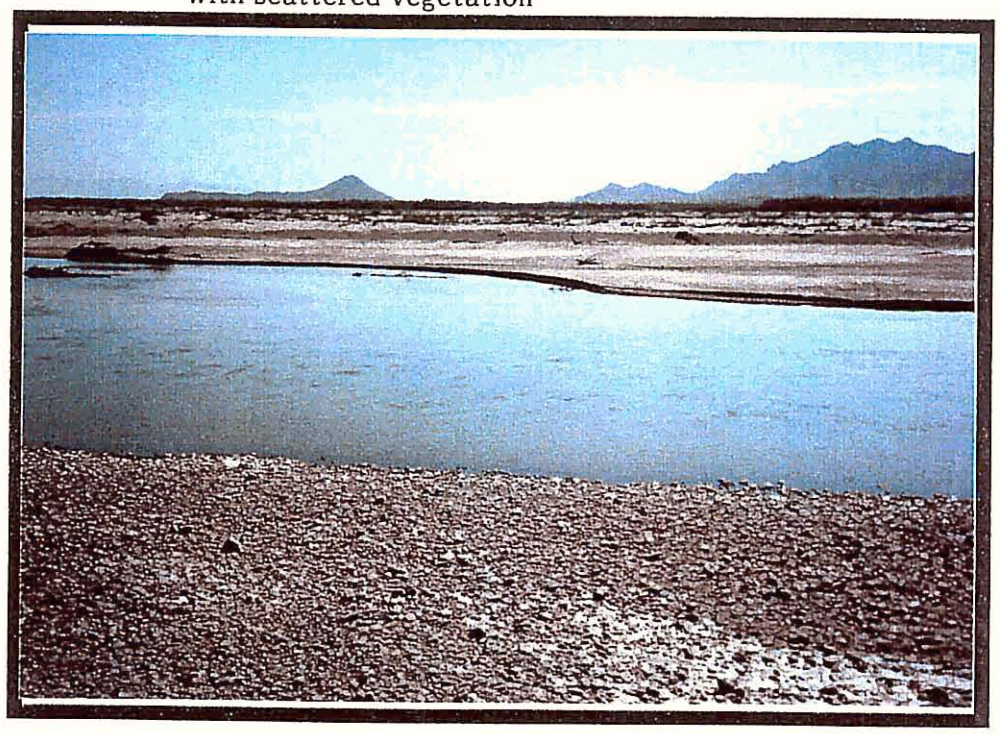


PHOTO 13 - Section 169.55 - Downstream of Desert Rose Rd. - Looking E. across channel - Channel consists of river rock, light, scattered vegetation

CROSS-SECTION(S) : 171.80 ±

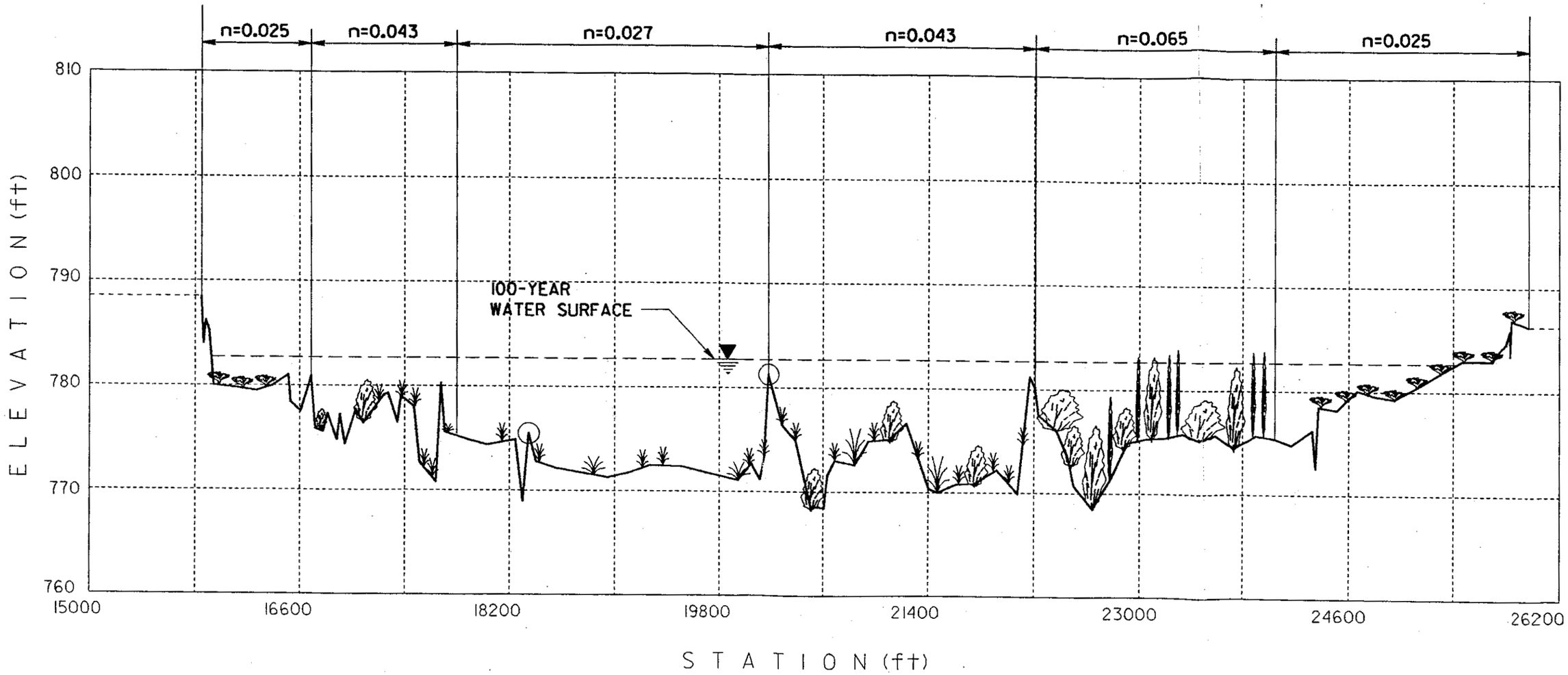
LOCATION : At bend in Gila River

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Vegetation in channel ranges from clear to dense salt cedar. Overbank vegetation is primarily dense salt cedar. Overflow channel consists of light vegetation and sandy soil.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	**Components**	**"n" Total**
Medium-Dense - Dense vegetation with partial clearings/openings	$n_b = 0.025$ $n_1 = 0.005$ $n_2 = 0.000$ $n_3 = 0.035$	**n = 0.065**
Medium - Trees, bushes *Semi-open*	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.014$	**n = 0.043**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 171.80
REACH 1
100–YEAR "n" VALUES



Vertical Scale 1: 10
Horizontal Scale 1: 800

FIGURE 8 – BEND IN GILA RIVER

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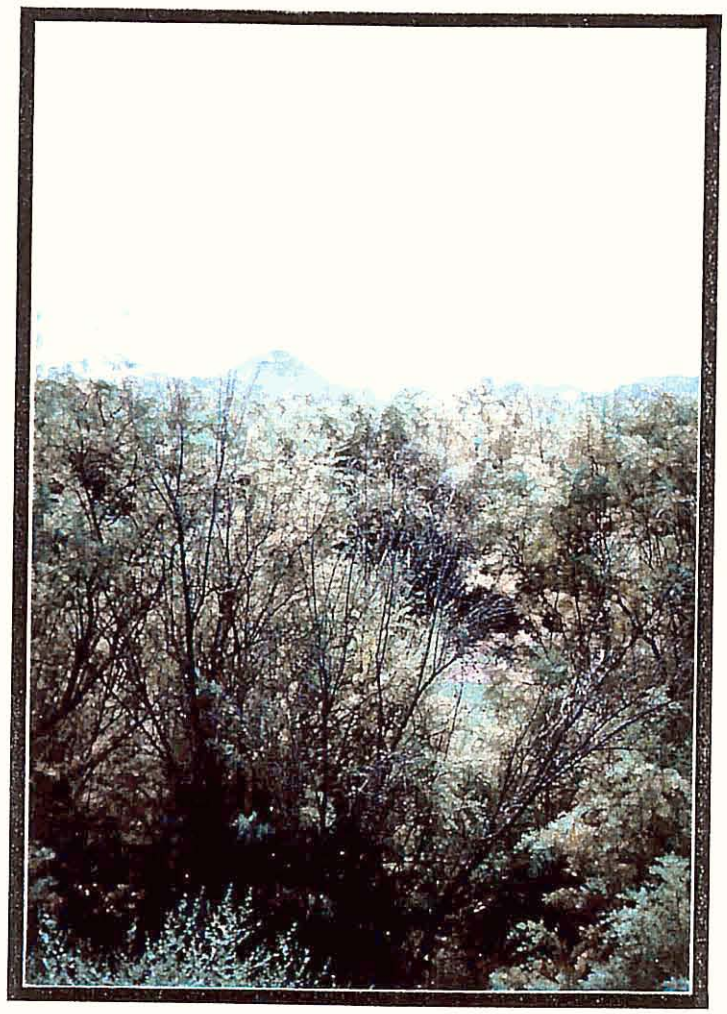

PHOTO 14 -
Section 171.80 - Bend in River - Dense vegetation in channel - Note dried mud in channel near center of picture

PHOTO 15 - Section 171.80 - Bend in River - Dense vegetation (salt cedar) in channel and overbanks

PHOTO 16 - Section 171.80 - Bend in River - Channel created by water which breached dike - W. side of dike - Light vegetation within overflow channel

CROSS-SECTION(S) : 173.46 ±

LOCATION : Arlington Road area; downstream of Hassayampa River

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Channel is primarily clear of vegetation. Dense vegetation exists along banks. Agricultural fields occupy the area beyond the banks.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Dense - Salt cedar typical		**n = 0.150**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

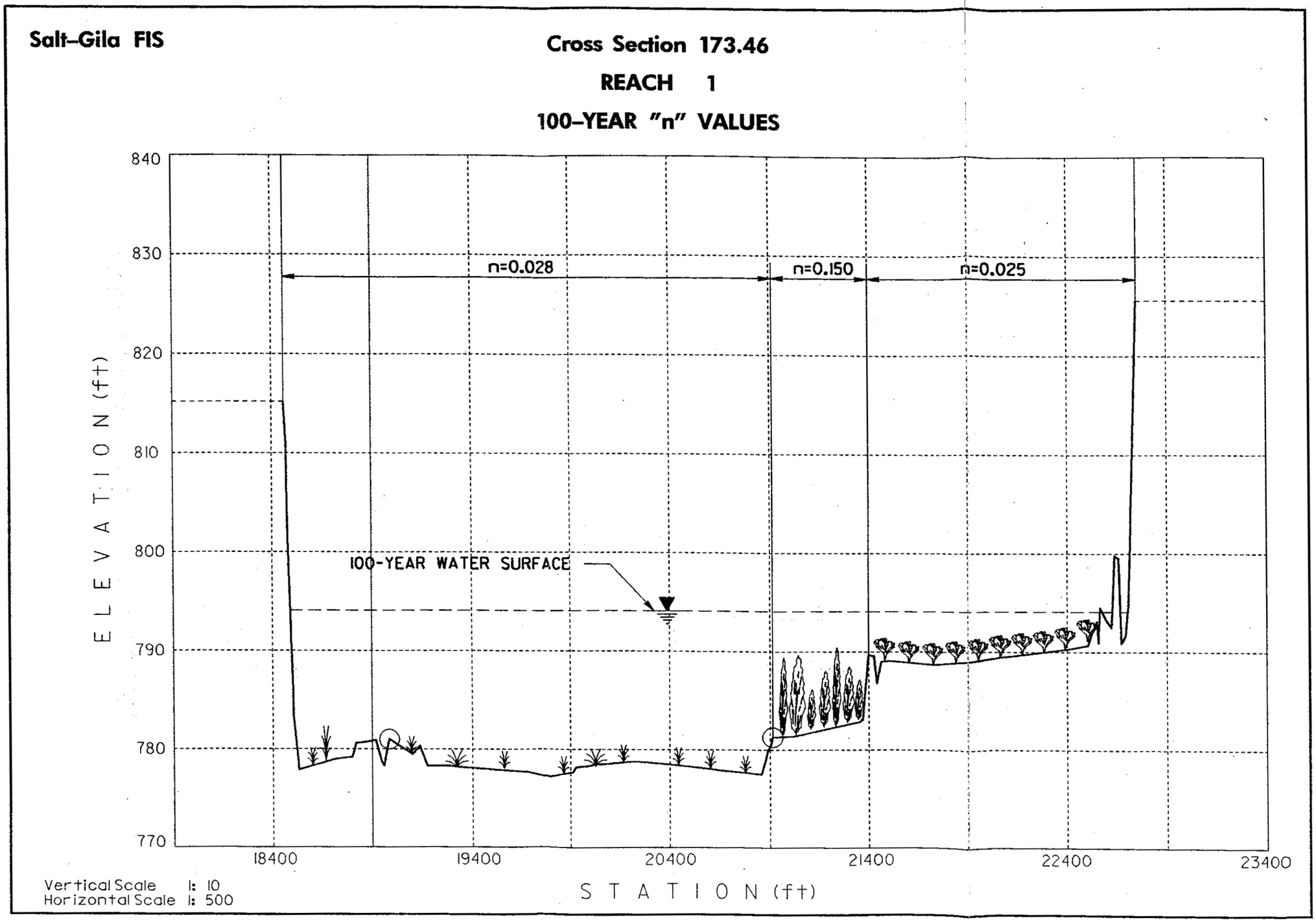

FIGURE 9 – DOWNSTREAM OF HASSAYAMPA RIVER

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PHOTO 17 - Section 173.46 - Downstream from Hassayampa River - Looking SW from Arlington Rd. area - Channel is clear with scattered vegetation - Ag. fields in right overbank

PHOTO 18 - Section 173.46 - Downstream from Hassayampa River - Looking S. from Arlington Rd. area - Channel is clear with scattered vegetation - Ag. fields in right overbank

PHOTO 19 - Section 173.46 - Downstream from Hassayampa River - Looking S. from Arlington Rd. area - Channel is clear with scattered vegetation - Ag. fields in right overbank

CROSS-SECTION(S) : 174.73 ±

LOCATION : Confluence with Hassayampa River

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Bed material is primarily silty/sandy. Channel is clear of vegetation. Vegetation in overbanks is dense salt cedar. Agricultural fields exist beyond dense vegetation.

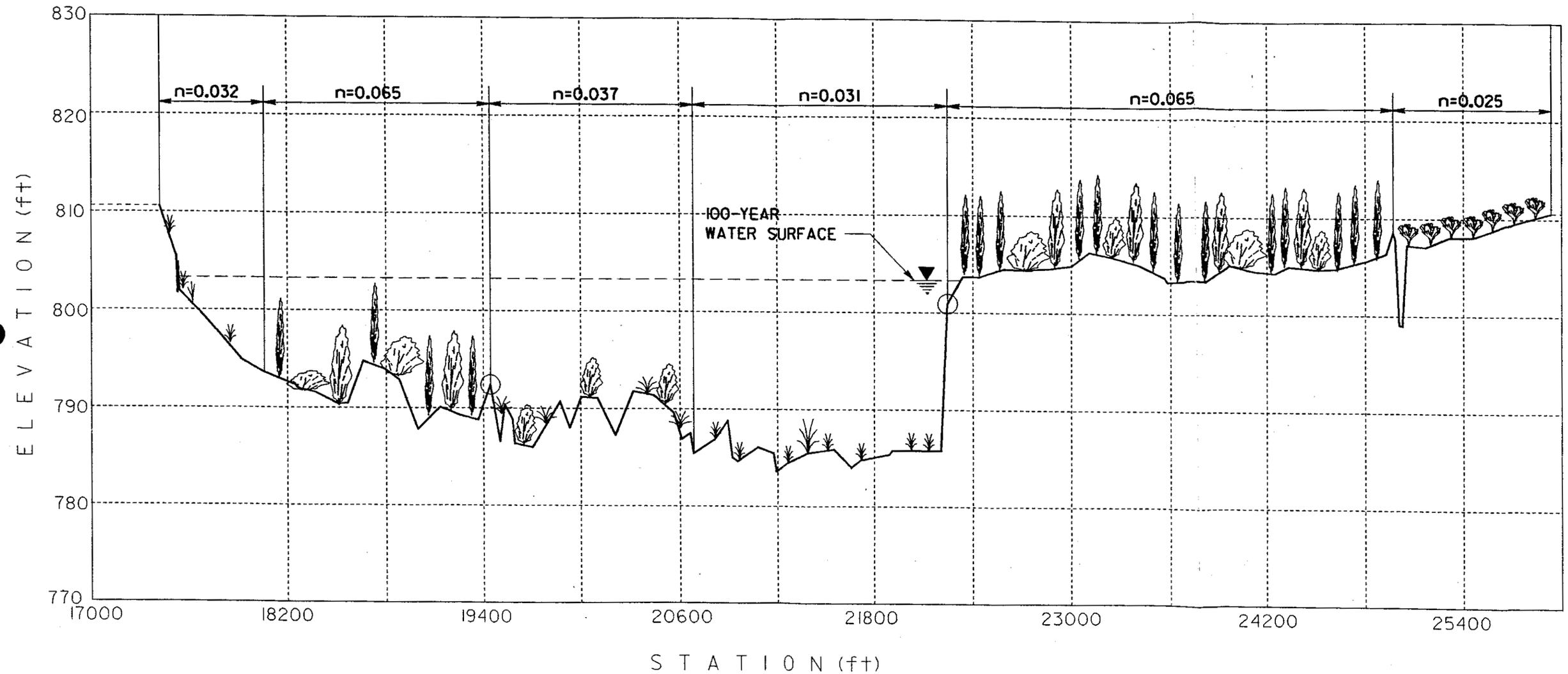
100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Medium-Dense - Dense vegetation with partial clearings/openings	n_b = 0.025 n_1 = 0.005 n_2 = 0.000 n_3 = 0.035	**n = 0.065**
Light-medium - Sparse vegetation with some pockets of thicker vegetation	n_b = 0.025 n_1 = 0.003 n_2 = 0.000 n_3 = 0.009	**n = 0.037**
Light - Sparse and/or small vegetation	n_b = 0.025 n_1 = 0.003 n_2 = 0.000 n_3 = 0.004	**n = 0.032**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 174.73

REACH 1

100–YEAR "n" VALUES



Vertical Scale 1: 10

Horizontal Scale 1: 600

FIGURE 10 – CONFLUENCE WITH HASSAYAMPA RIVER

Baker
Michael Baker Jr., Inc.

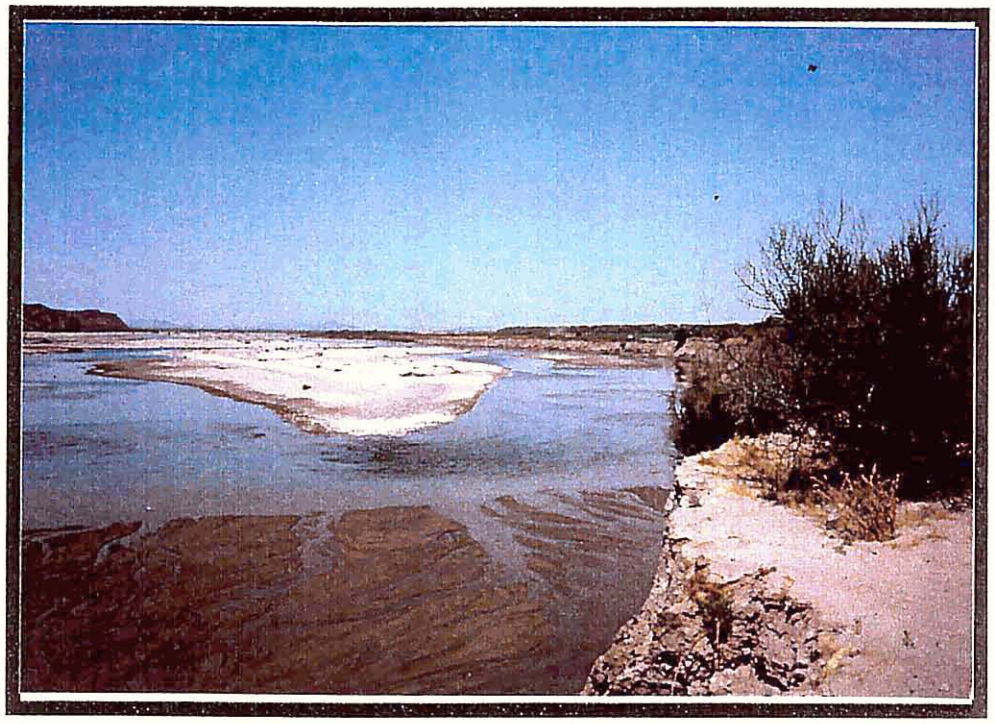


PHOTO 20 - Section 174.73 - Looking W. downstream of confluence with Hassayampa River - Channel is clear - Eroded banks

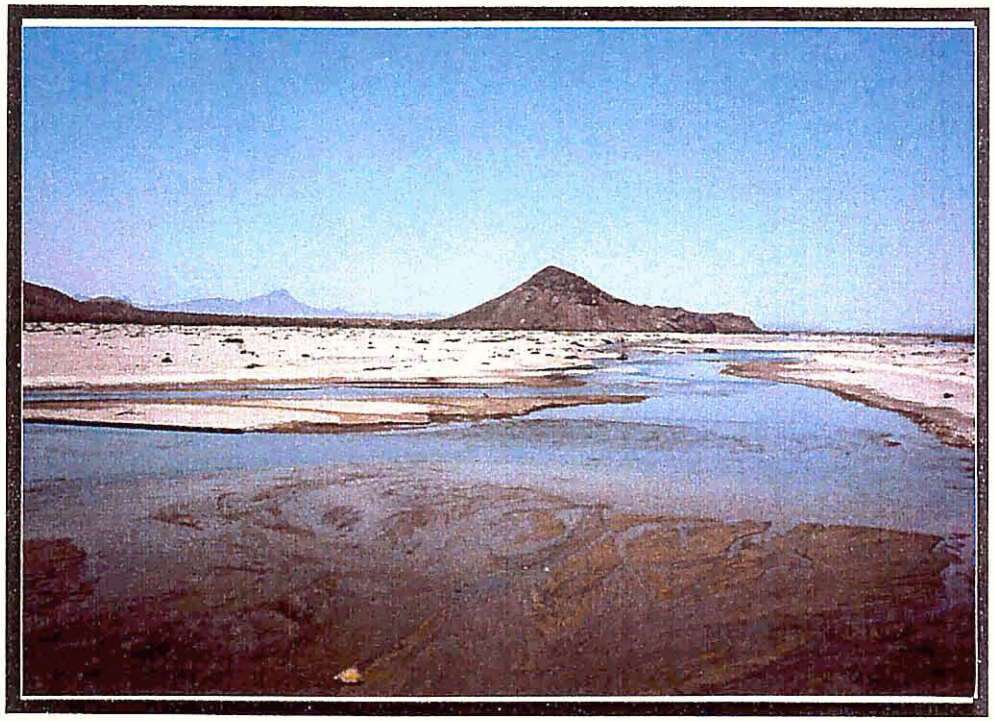


PHOTO 21 - Section 174.73 - Looking SW downstream of confluence with Hassayampa River - Channel is clear with scattered vegetation

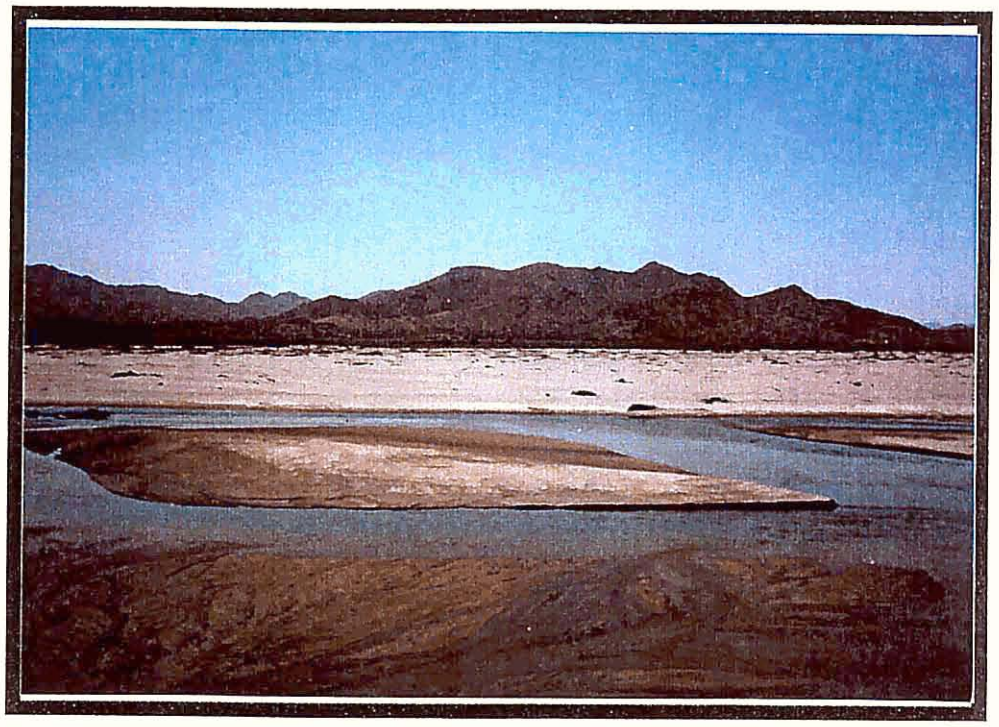


PHOTO 22 - Section 174.73 - Looking S. across channel at confluence with Hassayampa River - Channel is clear

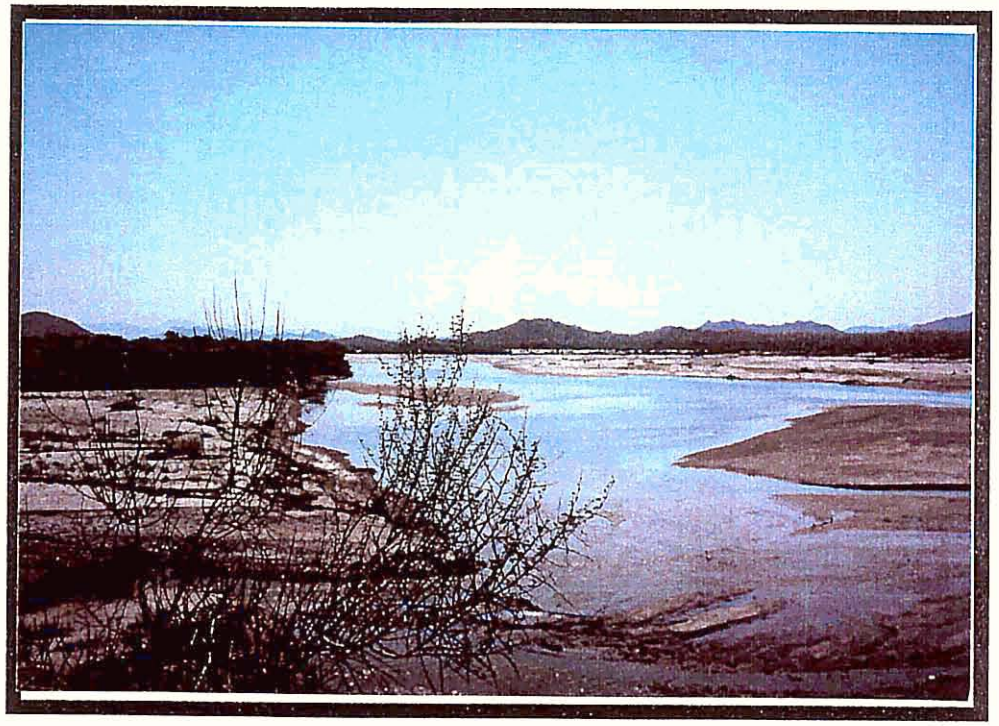


PHOTO 23 - Section 174.73 - Confluence of Hassayampa River - Channel is clear - Eroded banks

CROSS-SECTION(S) : 176.65 ±

LOCATION : Palo Verde Road alignment

CROSS-SECTION DESCRIPTION : *Channel shape is slightly irregular. Channel is primarily* clear of vegetation. Overbanks consist of dense salt cedar. Agricultural fields occupy the areas beyond the dense vegetation.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Dense - Salt cedar typical		**n = 0.150**
Medium - Trees, bushes Semi-open	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.014$	**n = 0.043**
Light-medium - Sparse vegetation with some pockets of thicker vegetation	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.009$	**n = 0.037**
Light - Sparse and/or small vegetation	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 176.65

REACH 1

100–YEAR "n" VALUES

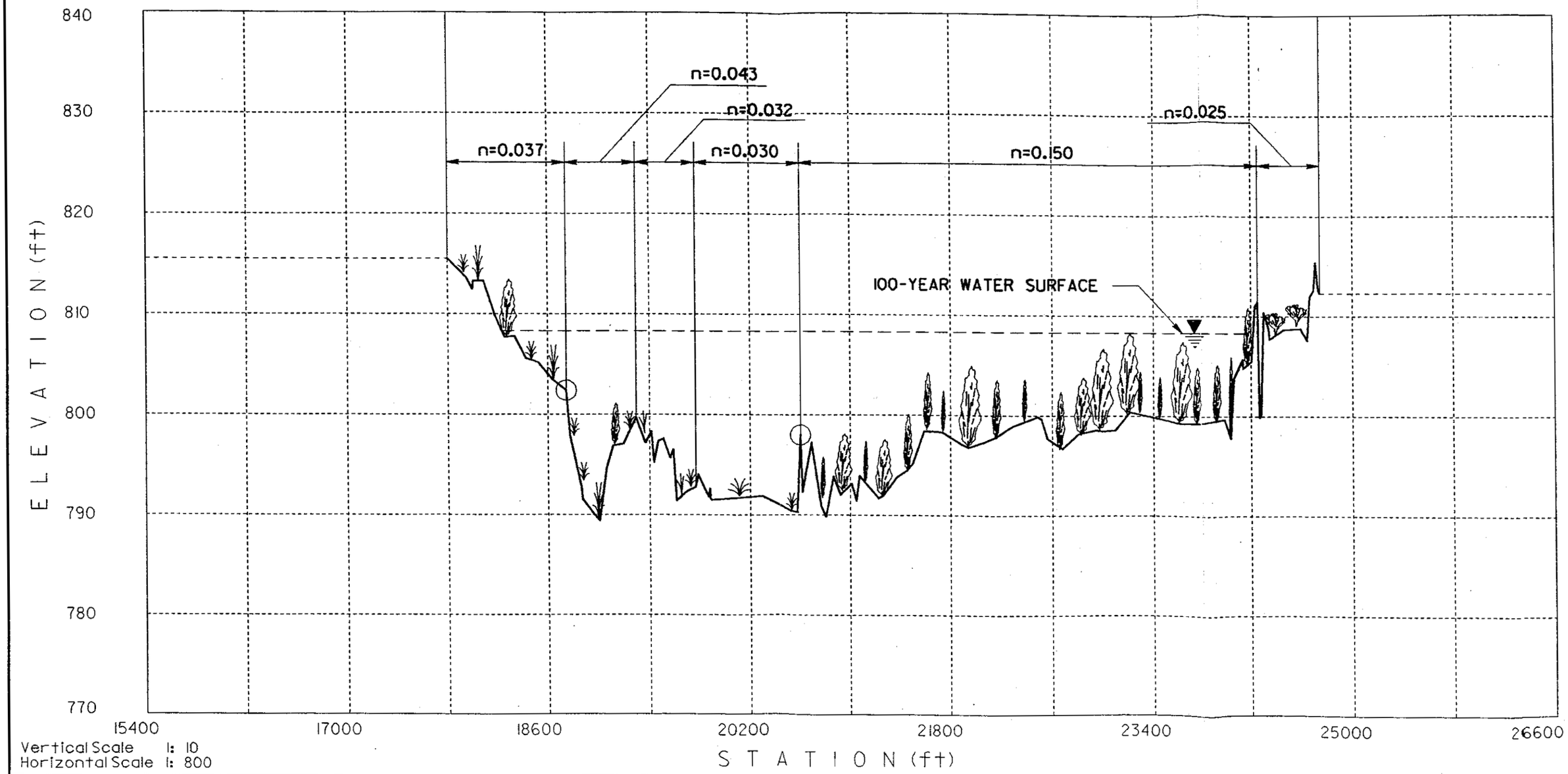


FIGURE 11 – PALO VERDE ROAD ALIGNMENT

Baker
Michael Baker Jr., Inc.

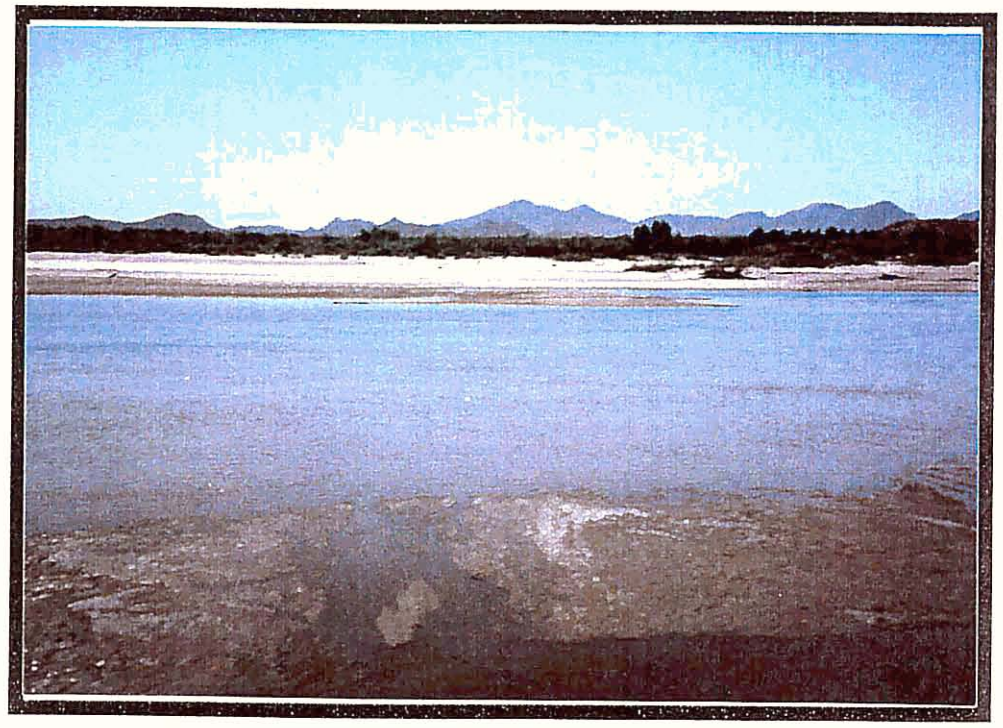


PHOTO 24 - Section 176.65 - Palo Verde alignment - Looking S. across channel - Channel is clear Dense vegetation in overbanks

PHOTO 25 - Section 176.65 - Palo Verde alignment - Looking E. across channel - Channel is clear Dense vegetation in overbanks

PHOTO 26 - Section 176.65 - Palo Verde alignment - Typical dense vegetation in overbank - approx. 15 ft. salt cedar

CROSS-SECTION(S) : 180.01 - 180.04 ±

LOCATION : SR 85 Bridge (Upstream and downstream)

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Bed material in channel is primarily sandy with river rock. Channel is clear of vegetation. Vegetation is dense in right overbank and ranges from light-medium in left overbank. There are some areas of light vegetation adjacent to the channel. Agricultural fields occupy area beyond dense vegetation.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Medium-Dense - Dense vegetation with partial clearings/openings	n_b = 0.025 n_1 = 0.005 n_2 = 0.000 n_3 = 0.035	**n = 0.065**
Light-medium - Sparse vegetation with some pockets of thicker vegetation	n_b = 0.025 n_1 = 0.003 n_2 = 0.000 n_3 = 0.009	**n = 0.037**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 180.01

REACH 1

100–YEAR "n" VALUES

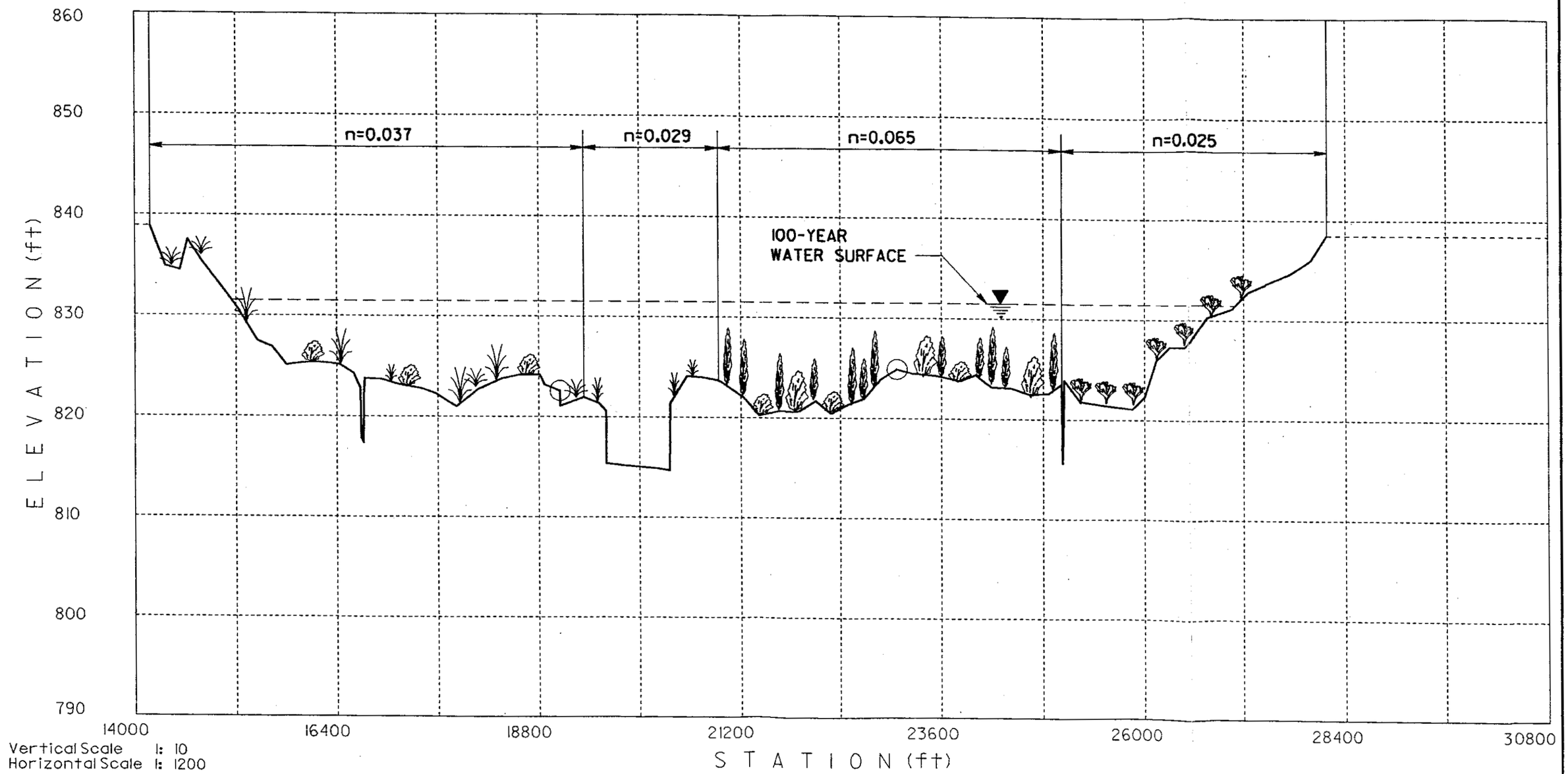


FIGURE 12 – SR 85 BRIDGE

Baker
Michael Baker Jr., Inc.

PHOTO 27 - Section 180.01 - SR 85 Bridge - Looking N. across channel - Channel is clear - Dense vegetation in overbanks

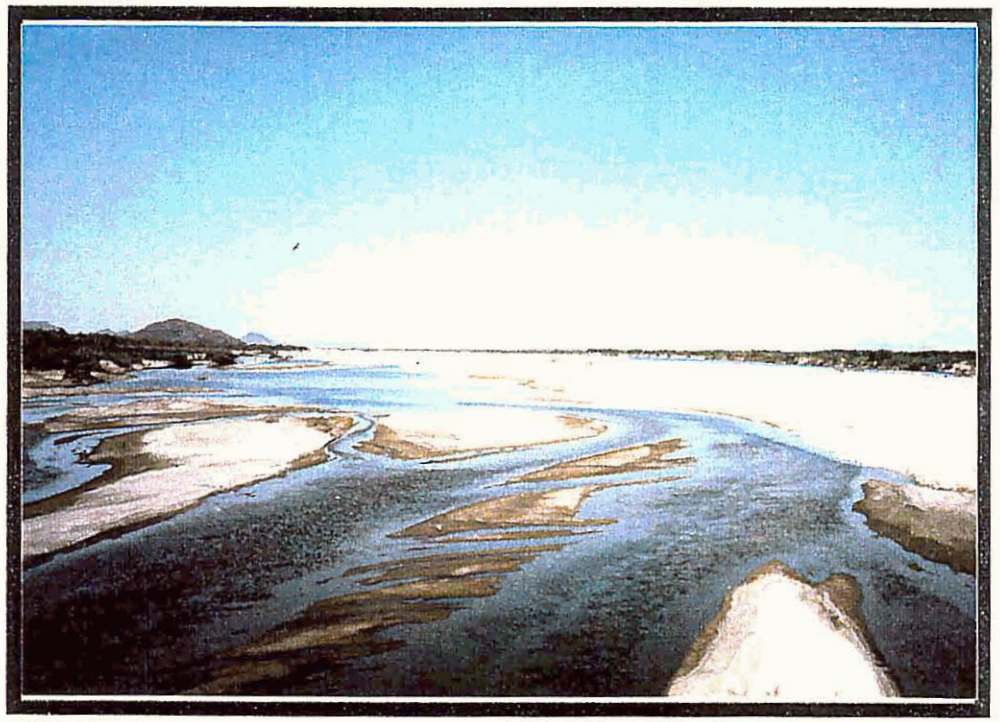


PHOTO 28 - Section 180.01 - SR 85 Bridge - Looking downstream along channel - Channel is clear

PHOTO 29 - Section 180.01 - SR 85 Bridge - Looking downstream towards left overbank - Medium to dense vegetation in overbank - Channel is clear

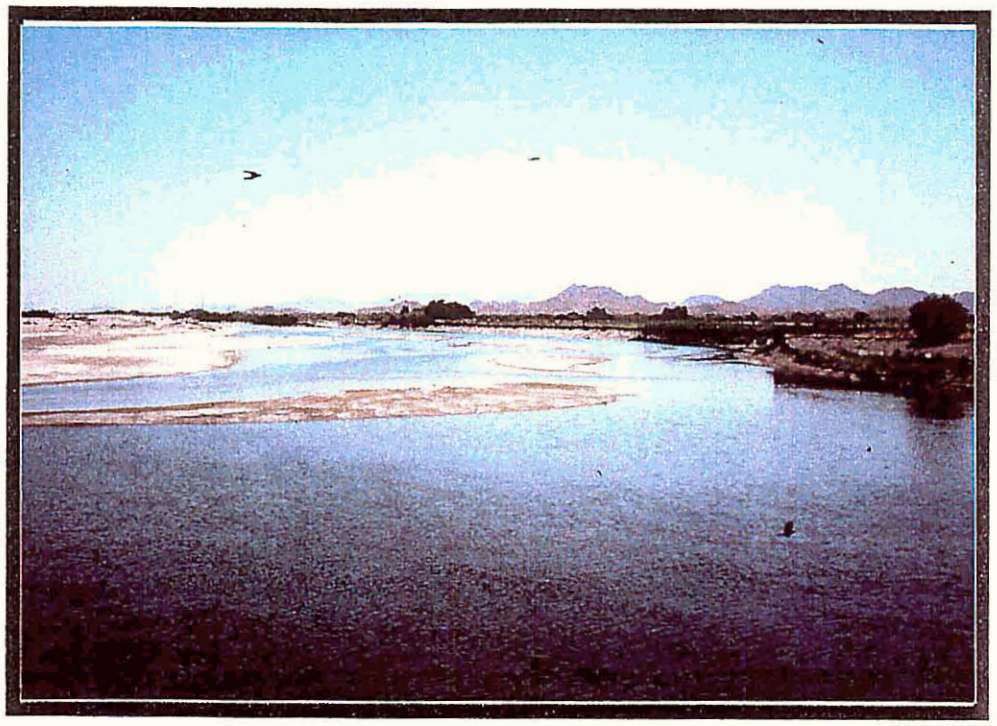


PHOTO 30 - Section 180.01 - SR 85 Bridge - Looking upstream along channel - Channel is clear - Light to medium vegetation in left overbank (to right in picture)

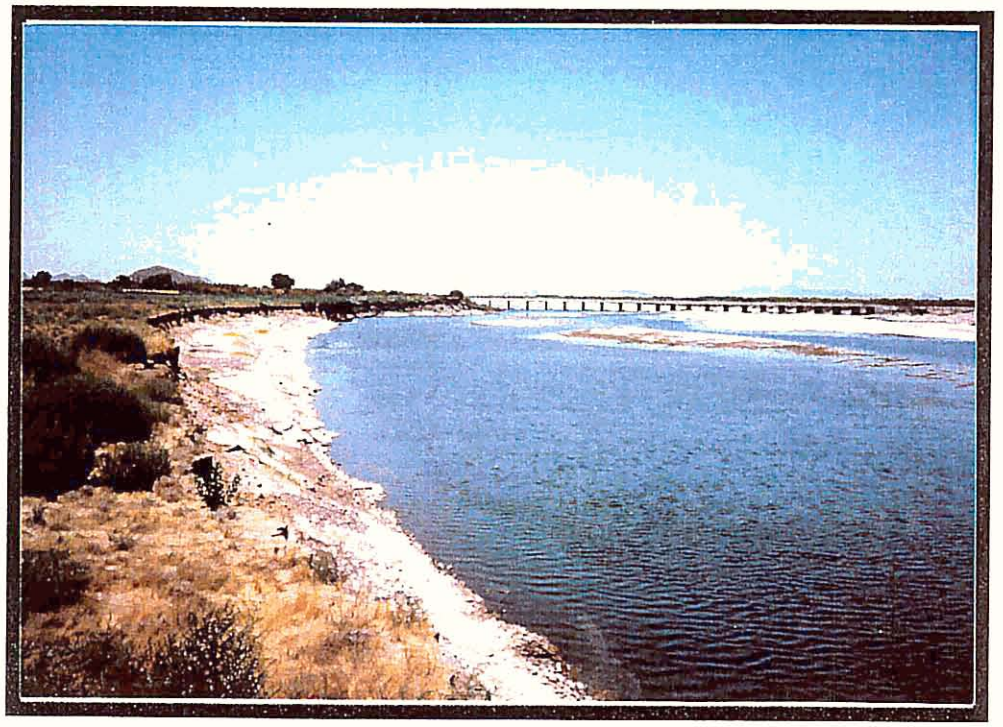


PHOTO 31 - Section 180.03 - E. of SR 85 Bridge - Looking W. along channel toward bridge - Channel is clear - Light vegetation in left overbank - Eroded banks

PHOTO 32 - Section 180.03 - E. of SR 85 Bridge - Looking N. across channel - Channel is clear - Medium - dense vegetation in right overbank

PHOTO 33 - Section 180.03 - E. of SR 85 Bridge - Looking E. along channel - Channel is clear with scattered vegetation

CROSS-SECTION(S) : 187.06 ±

LOCATION : Airport Road crossing

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Channel is primarily clear of vegetation. Overbanks contain dense vegetation with areas of open space. Bed material in the channel consists of river rock.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	**Components**	**"n" Total**
Medium-Dense - Dense vegetation with partial clearings/openings	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.036$	**n = 0.065**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 187.06

REACH 2

100-YEAR "n" VALUES

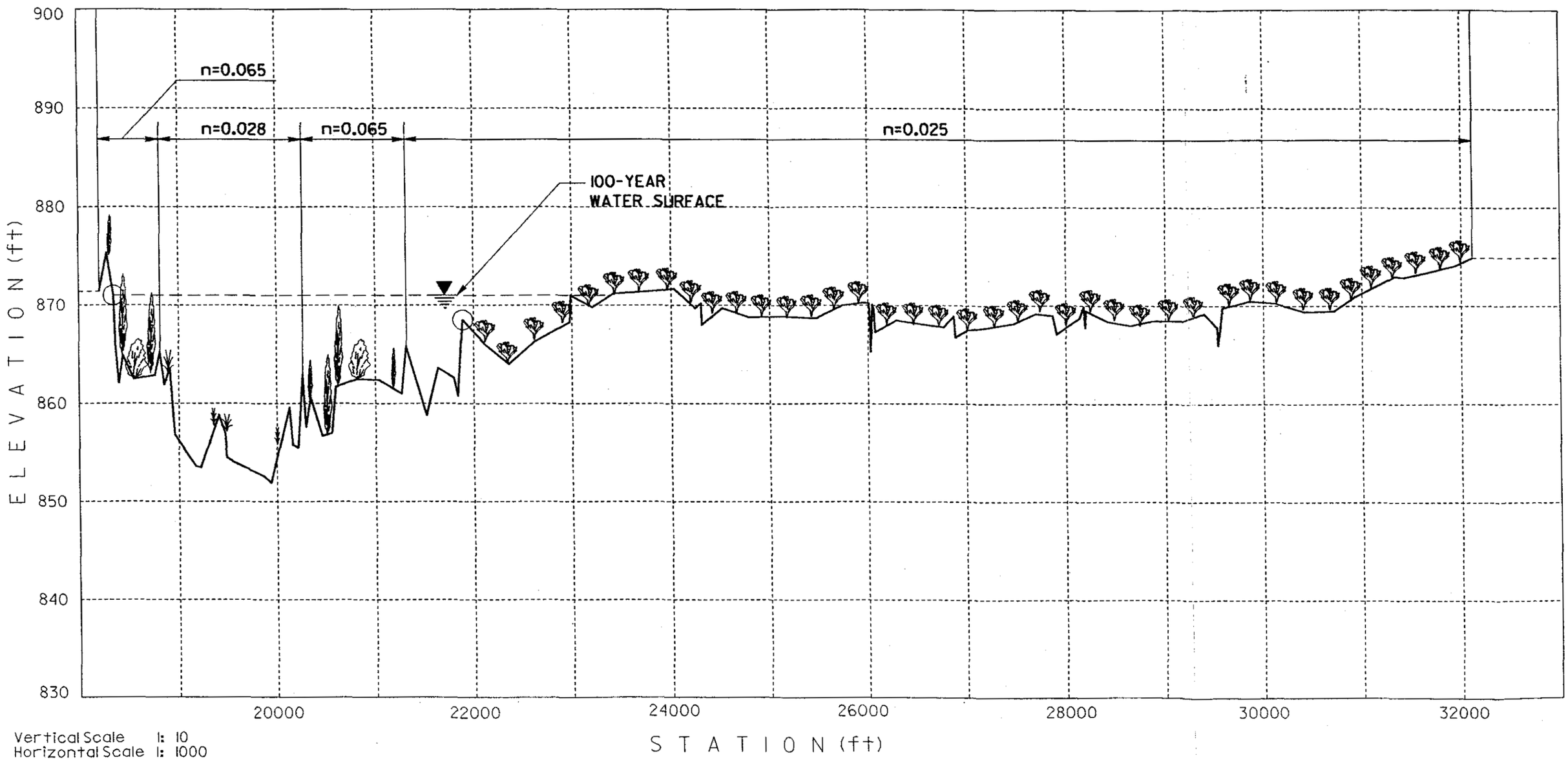


FIGURE 13 – AIRPORT ROAD CROSSING

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Michael Baker Jr., Inc.

PHOTO 34 - Section 187.06 - Airport Rd. crossing - Looking across channel - Light vegetation in channel - Medium to dense vegetation in overbank

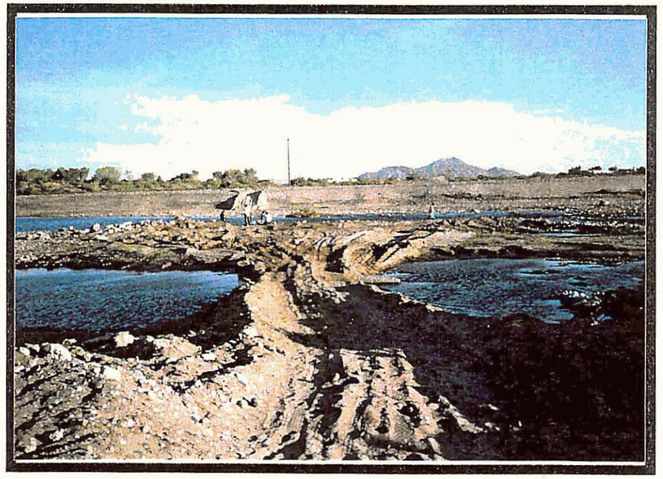


PHOTO 35 - Section 187.06 - Airport Rd. crossing - Looking across channel - Light vegetation in channel - Medium to dense vegetation in overbank

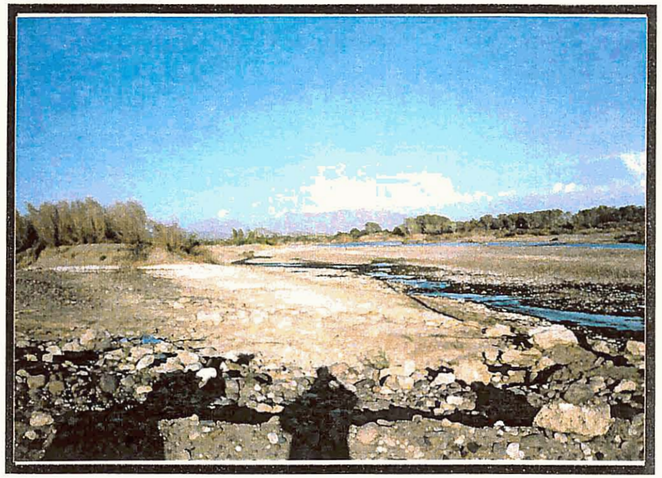


PHOTO 36 - Section 187.06 - Airport Rd. crossing - Looking upstream along channel - Channel is clear

PHOTO 37 - Section 187.06 - Airport Rd. crossing - Looking N. away from channel - River rock and dense vegetation in overbank

CROSS-SECTION(S) : 188.05 ±

LOCATION : Tuthill Road Bridge

CROSS-SECTION DESCRIPTION : Channel is slightly irregular. Medium-dense vegetation exists in the left overbank. Light vegetation and agricultural fields are located in the right overbank. Channel is primarily clear of vegetation. Bed material consists of river rock.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Medium-Dense - Dense vegetation with partial clearings/openings	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.036$	**n = 0.065**
Agricultural - Cotton Fields		**n = 0.025**
Light - Sparse and/or small vegetation	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 188.05

REACH 2

100–YEAR "n" VALUES

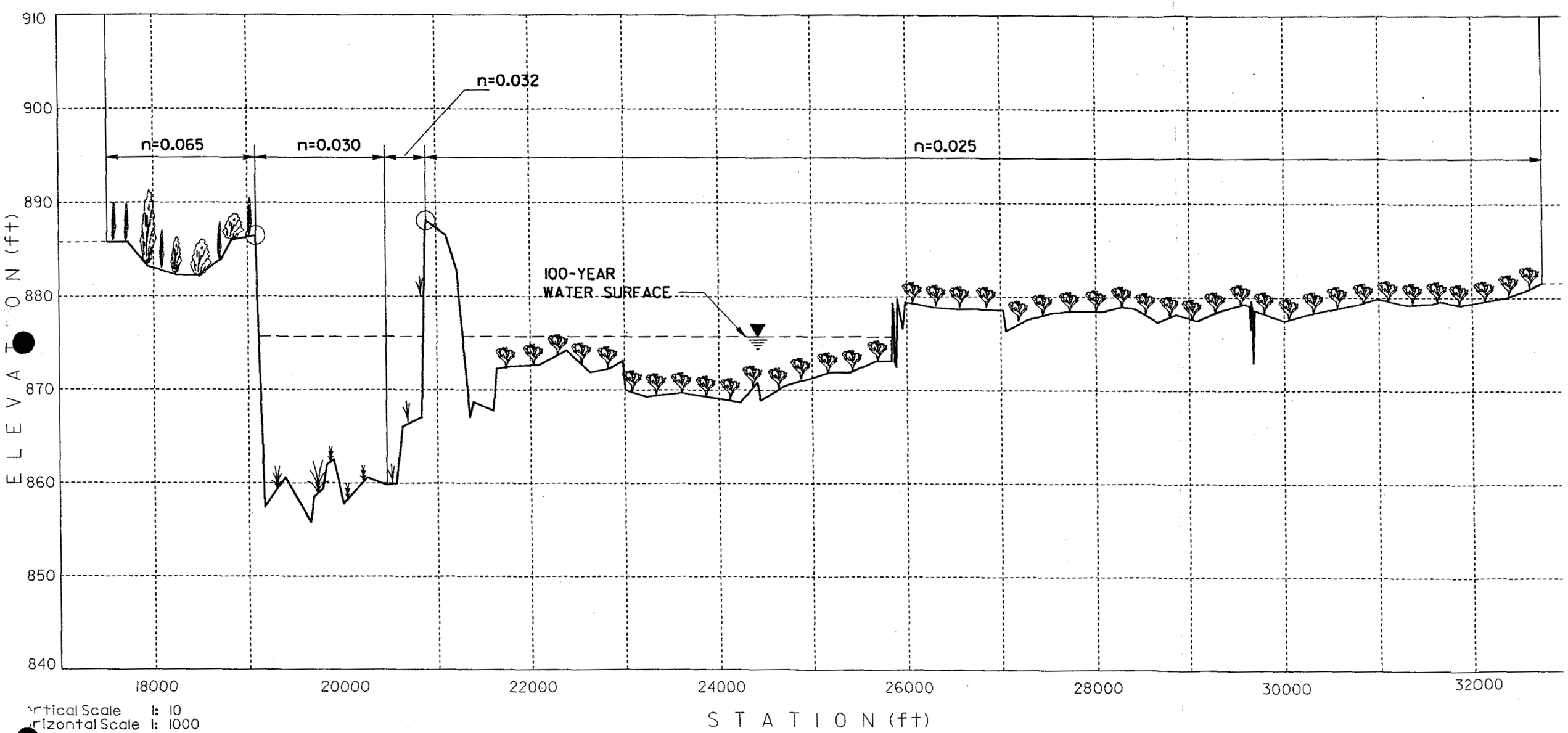


FIGURE 14 – TUTHILL ROAD BRIDGE

Baker
Michael Baker Jr., Inc.

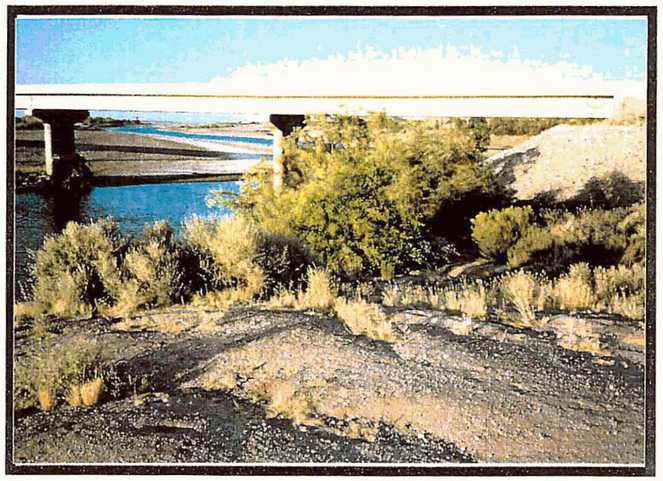


PHOTO 38 - Section 188.05 - Tuthill Bridge - Looking upstream towards bridge - Channel is clear - Light vegetation in overbank

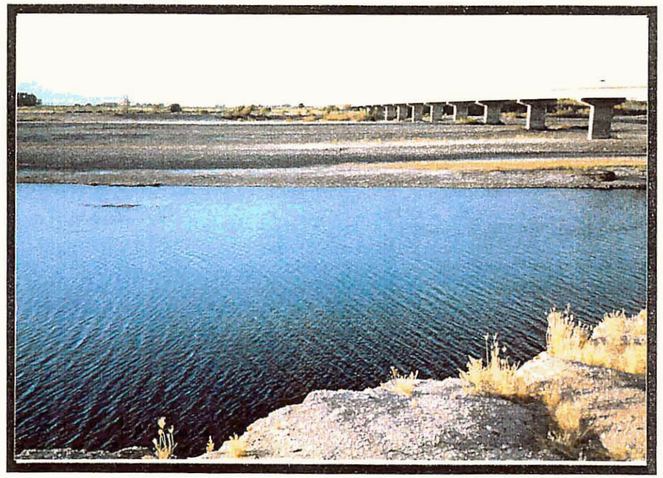


PHOTO 39 - Section 188.05 - Tuthill Bridge - Looking N. across channel - Channel is clear - Light vegetation in overbank

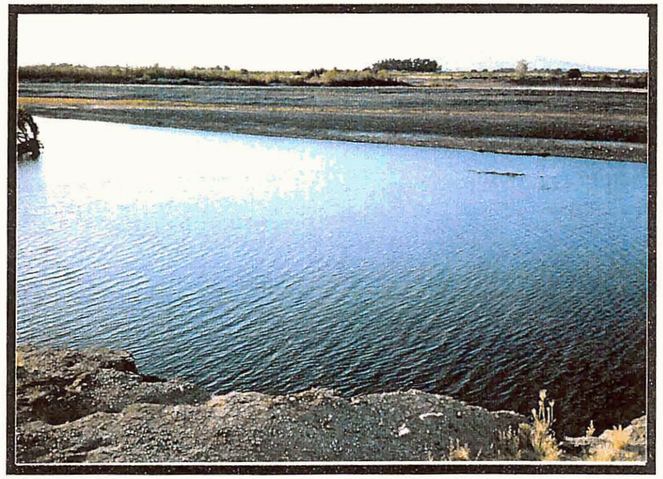


PHOTO 40 - Section 188.05 - Tuthill Bridge - Looking across channel - Channel is clear - Light vegetation in overbank

CROSS-SECTION(S) : 192.33 ±

LOCATION : Cotton Lane alignment

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Bed material is primarily river rock with areas of sandy soil. Channel is clear of vegetation. Left overbank consists of dense salt cedar and right overbank light-medium vegetation and agricultural fields.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Medium-Dense - Dense vegetation with partial clearings/openings	n_b = 0.025 n_1 = 0.004 n_2 = 0.000 n_3 = 0.036	**n = 0.065**
Medium - Trees, bushes Semi-open	n_b = 0.025 n_1 = 0.004 n_2 = 0.000 n_3 = 0.014	**n = 0.043**
Light - Sparse and/or small vegetation	n_b = 0.025 n_1 = 0.003 n_2 = 0.000 n_3 = 0.004	**n = 0.032**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

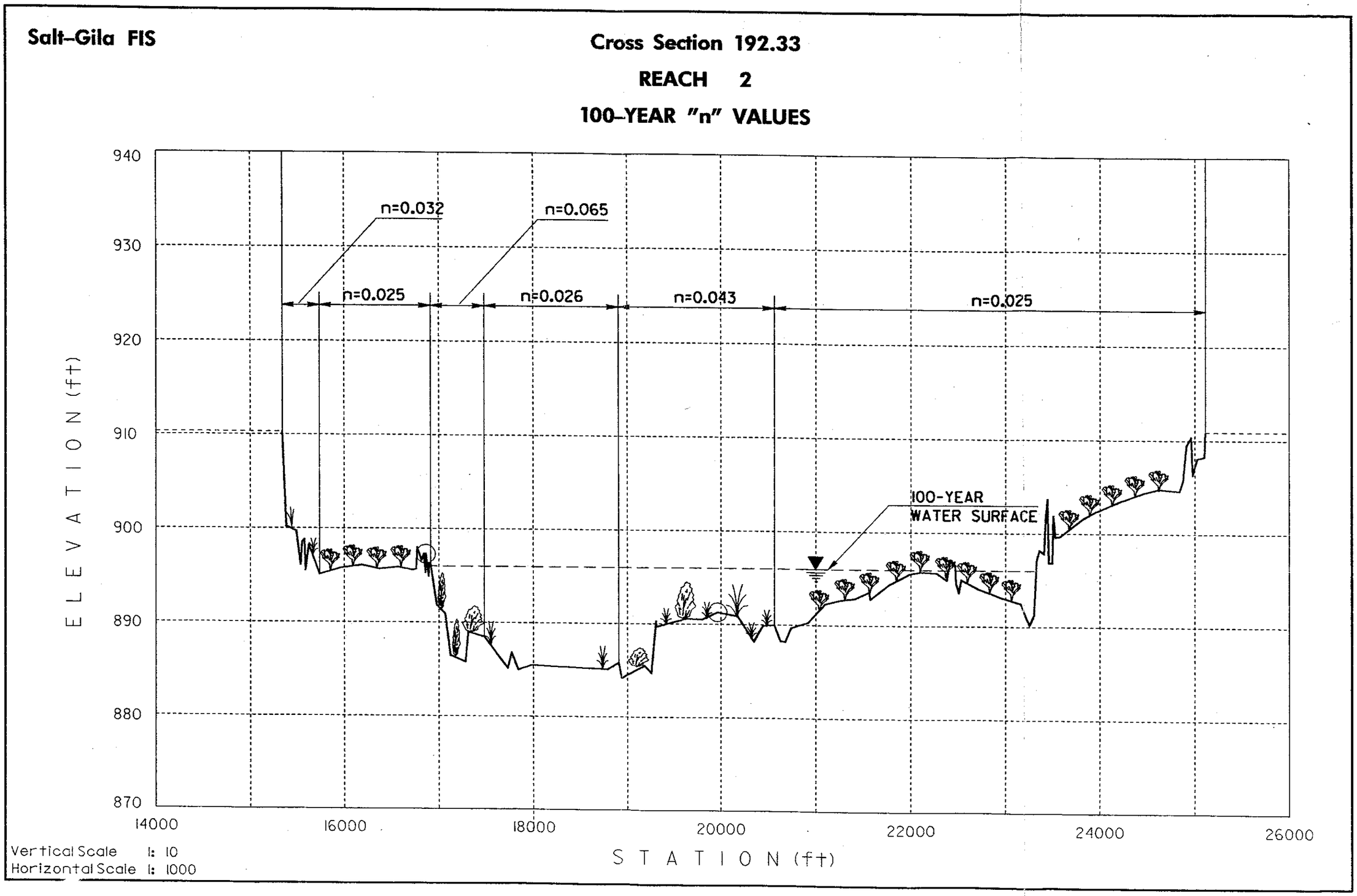


FIGURE 15 – COTTON LANE ALIGNMENT

Baker
Michael Baker Jr., Inc.

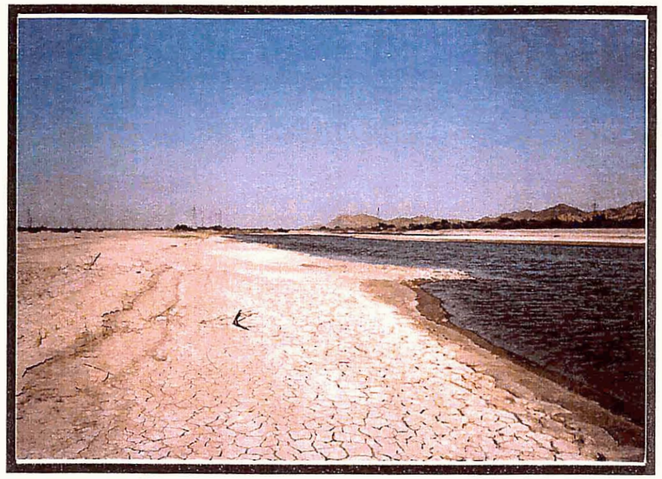


PHOTO 41 - Section 192.33 - Cotton Ln. alignment - Looking E. along channel - Channel is clear

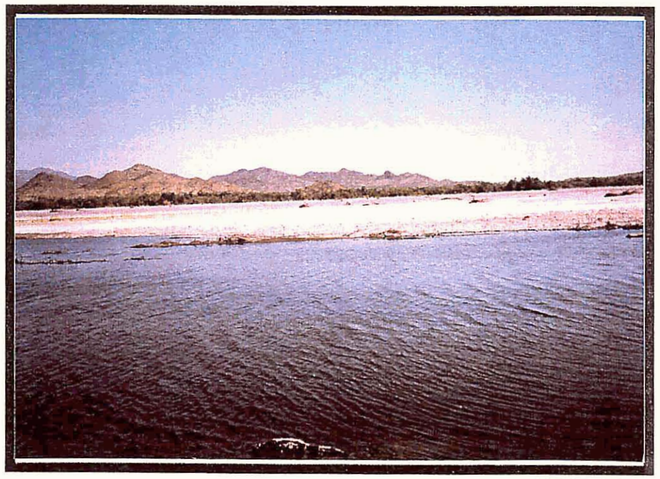


PHOTO 42 - Section 192.33 - Cotton Ln. alignment - Looking S. across channel - Channel is clear Dense vegetation in left overbank

PHOTO 43 - Section 192.33 - Cotton Ln. alignment - Looking W. along channel - Channel is clear with scattered vegetation - River rock in river bed

PHOTO 44 - Section 192.33 - Cotton Ln. alignment - Looking W. along channel - River rock in river bed - Medium vegetation in right overbank

CROSS-SECTION(S) : 194.29 ±

LOCATION : Estrella Parkway Bridge

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Bed material consists primarily of river rock. Channel is clear of vegetation. Overbanks consist of light-medium vegetation. Rip-rap bank protection under the bridge. Agricultural fields exist in overbanks.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Medium - Trees, bushes Semi-open	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.014$	**n = 0.043**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 194.29

REACH 2

100–YEAR "n" VALUES

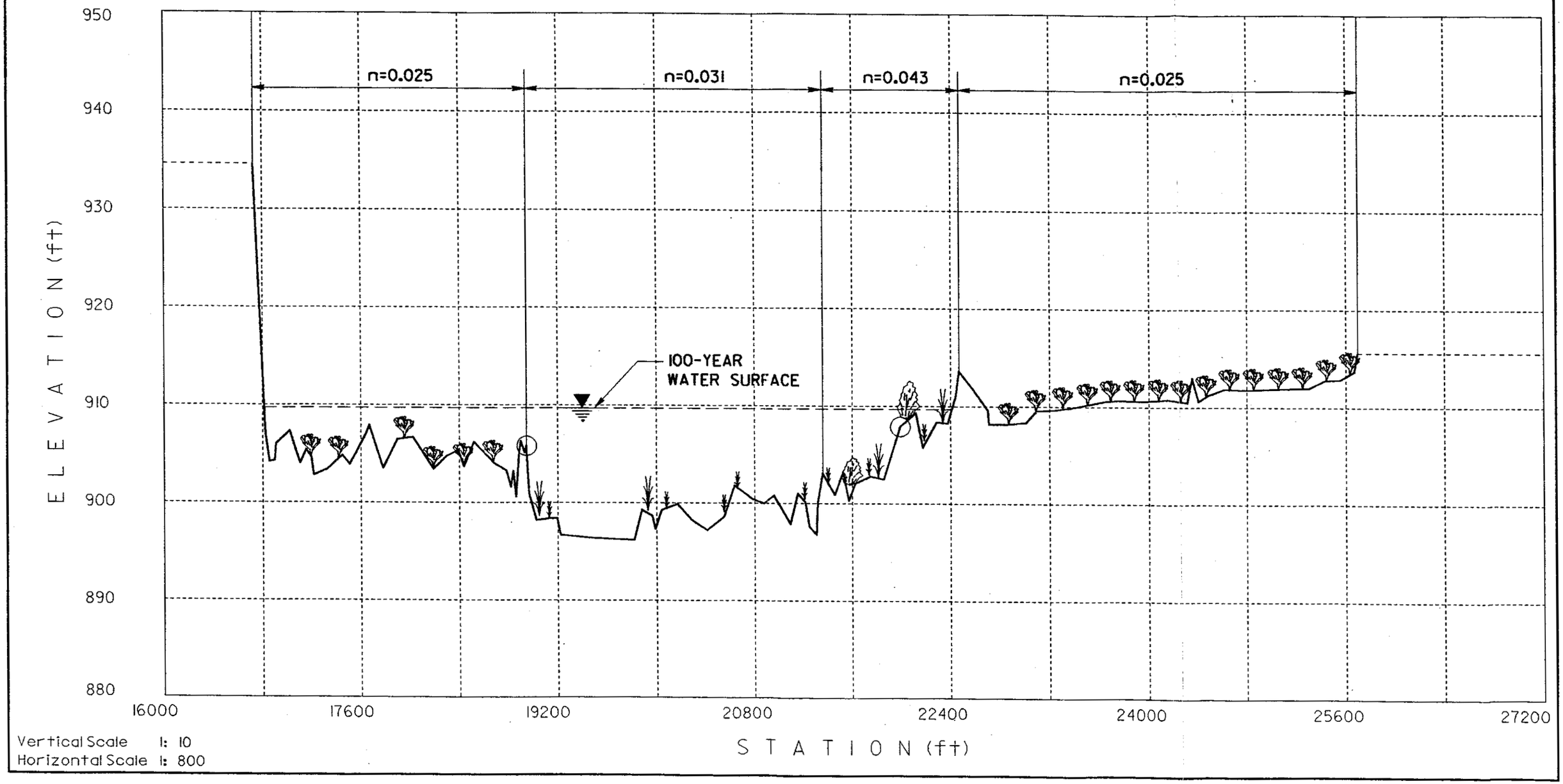


FIGURE 16 – ESTRELLA PARKWAY BRIDGE

Baker
Michael Baker Jr., Inc.

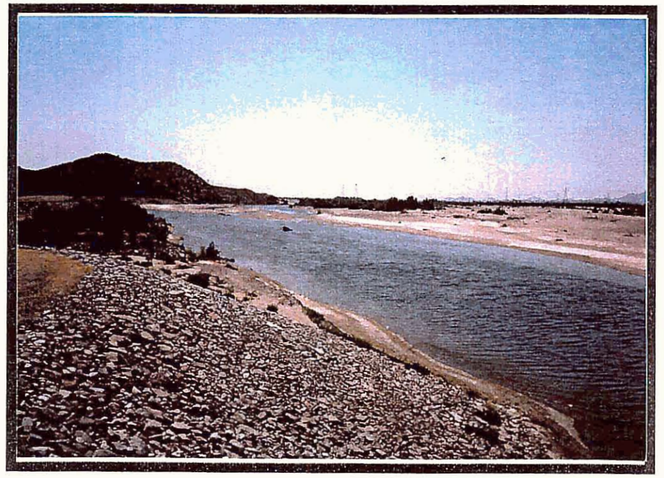


PHOTO 45 - Section 194.29 - Estrella Parkway Bridge - Looking W. along channel - Bank protection along left bank - Channel is clear with scattered vegetation

PHOTO 46 - Section 194.29 - Estrella Parkway Bridge - Looking N. across channel - Channel is clear - Medium vegetation in right overbank

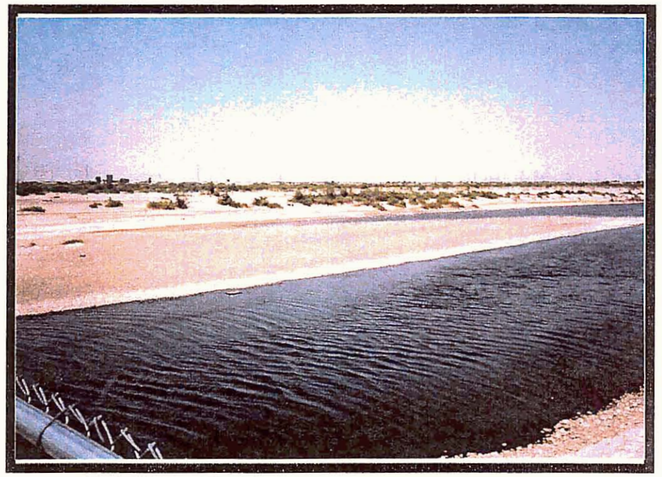


PHOTO 47 - Section 194.29 - Estrella Parkway Bridge - Looking N. across channel - Channel is clear - Light vegetation in right overbank

PHOTO 48 - Section 194.29 - Estrella Parkway Bridge - Looking E. along channel - Channel is clear - Light to medium vegetation in overbanks

CROSS-SECTION(S) : 195.14 ±

LOCATION : Bullard Avenue Bridge

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Bed material consists of sandy soil and river rock. Channel is predominantly clear of vegetation. Pockets of light vegetation exist. Left overbank contains medium vegetation. Right overbank contains light vegetation. Agricultural fields occupy land beyond the overbank vegetation.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	**Components**	**"n" Total**
Medium - Trees, bushes Semi-open	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.014$	**n = 0.043**
Light - Sparse and/or small vegetation	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 195.14
REACH 2
100-YEAR "n" VALUES

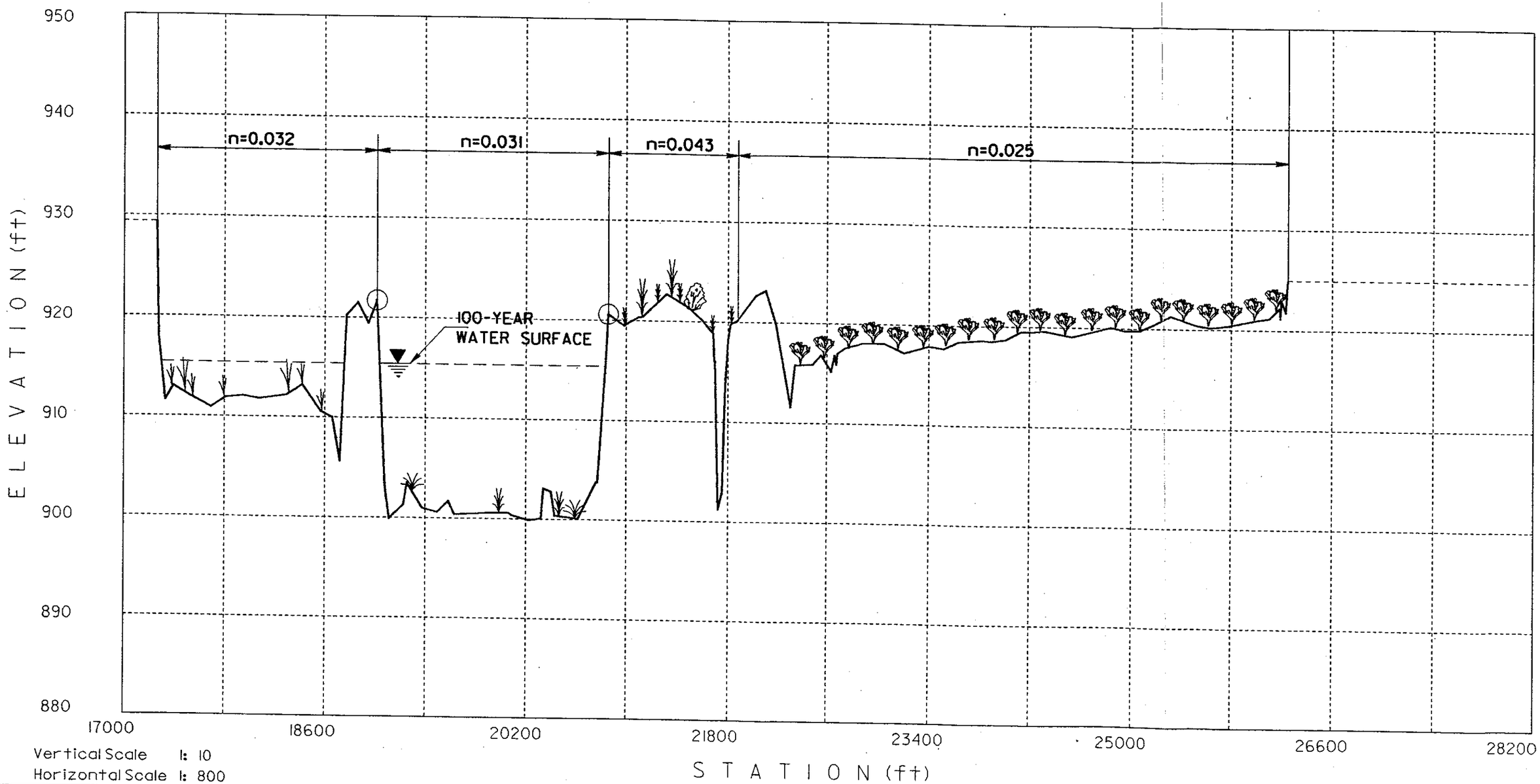


FIGURE 17 – BULLARD AVENUE BRIDGE

Baker
Michael Baker Jr., Inc.

PHOTO 49 - Section 195.14 - Bullard Ave. Bridge - Looking E. along channel - Channel is clear with scattered vegetation - Medium to dense vegetation in overbanks

PHOTO 50 - Section 195.14 - Bullard Ave. Bridge - Looking NE along channel - Channel is clear with scattered vegetation - Medium vegetation in right overbank

PHOTO 51 - Section 195.14 - Bullard Ave. Bridge - Looking NW across channel - Channel is clear with scattered vegetation - Medium vegetation in right overbank

PHOTO 52 - Section 195.14 - Bullard Ave. Bridge - Looking W. along channel - Channel is clear with scattered vegetation

CROSS-SECTION(S) : 198.30 ±

LOCATION : El Mirage Road crossing

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Bed material is river rock. Channel is primarily clear of vegetation. There is a pocket of dense vegetation in main channel. Agricultural fields exist in right overbank.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Dense - Salt cedar typical		**n = 0.150**
Medium - Trees, bushes Semi-open	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.014$	**n = 0.043**
Agricultural - Cotton Fields		**n = 0.025**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 1)		**n = 0.026 - 0.033**

Cross Section 198.30

REACH 2

100–YEAR "n" VALUES

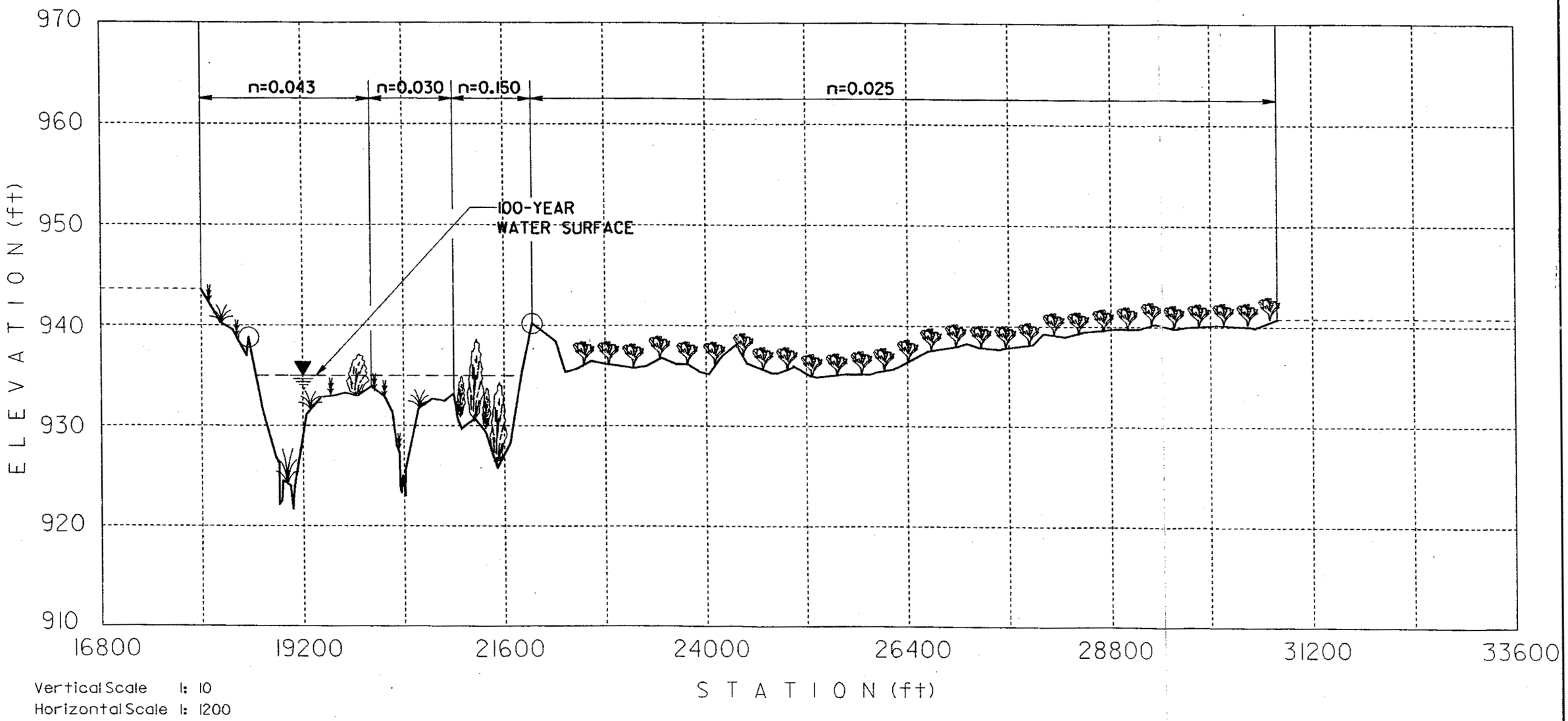


FIGURE 18 – EL MIRAGE ROAD CROSSING

Baker
Michael Baker Jr., Inc.

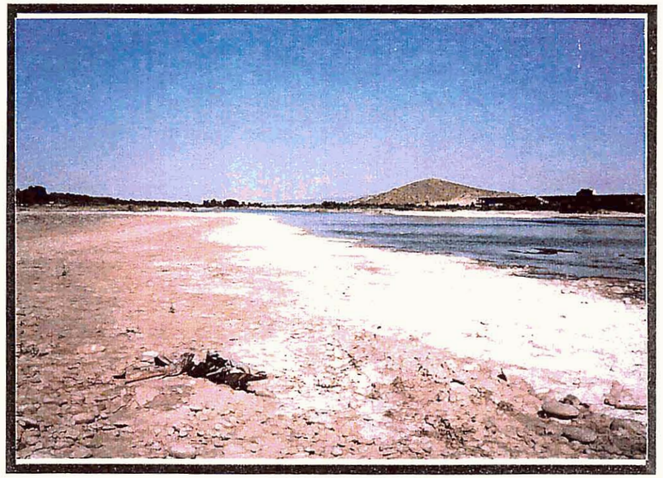


PHOTO 53 - Section 198.30 - El Mirage Rd. - Looking E. along channel - Channel is clear

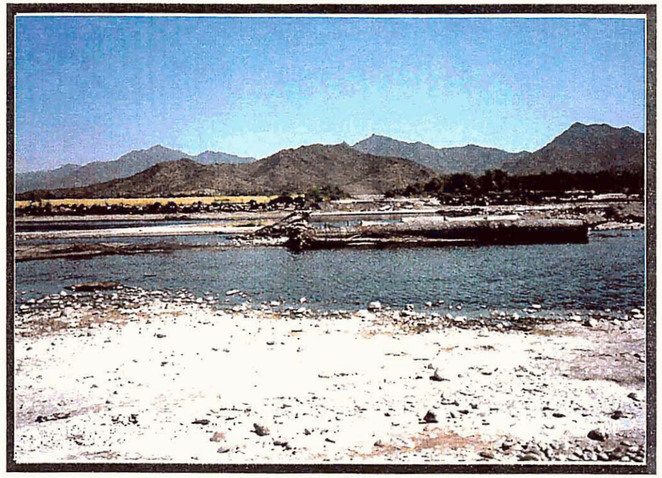


PHOTO 54 - Section 198.30 - El Mirage Rd. - Looking S. across channel - Channel is clear with scattered vegetation - Light-medium-dense vegetation in overbanks

PHOTO 55 - Section 198.30 - El Mirage Rd. - Looking W. along channel - River rock in river bed - Dense vegetation in left overbank

PHOTO 56 - Section 198.30 - El Mirage Rd. - Looking W. along channel - River rock in river bed - Dense vegetation in right overbank

CROSS-SECTION(S) : 199.44 ±

LOCATION : 115th Avenue crossing

CROSS-SECTION DESCRIPTION : Channel shape is slightly irregular. Bed material is river rock. Channel is primarily clear of vegetation. Medium-dense and dense vegetation exist within the main channel near the channel limits. Residential development exists beyond the right channel limit.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	**Components**	**"n" Total**
Dense - Salt cedar typical		**n = 0.150**
Medium-Dense - Dense vegetation with partial clearings/openings	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.036$	**n = 0.065**
Light - Sparse and/or small vegetation	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**
Agricultural - Cotton Fields		**n = 0.025**

Cross Section 199.44
REACH 2
100-YEAR "n" VALUES

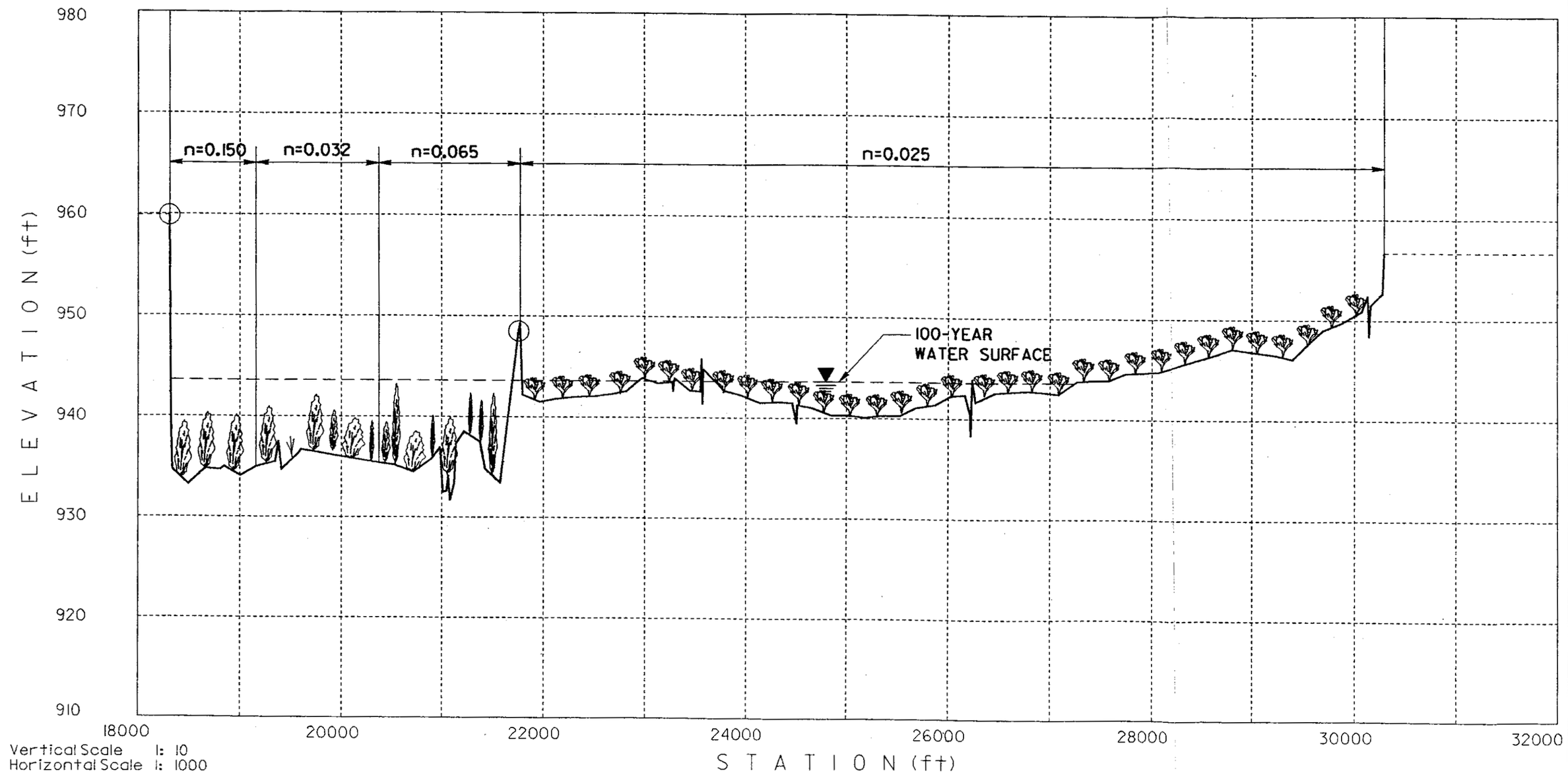


FIGURE 19 – 115th AVENUE CROSSING

Baker
Michael Baker Jr., Inc.

PHOTO 57 - Section 199.44 - 115th Ave. - Looking E. along channel - Channel is clear - Dense vegetation in right overbank

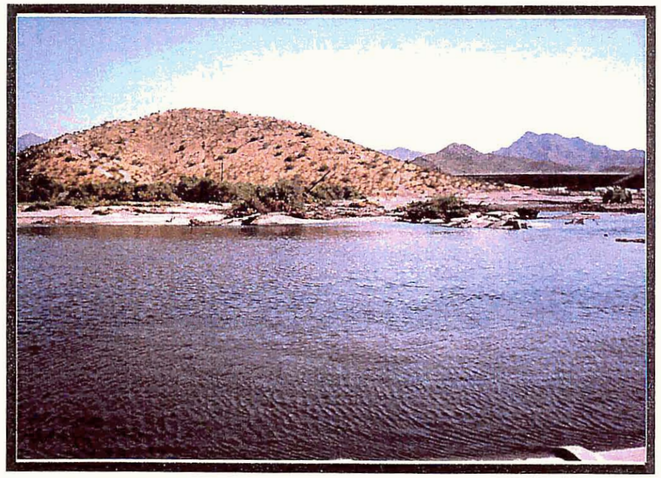


PHOTO 58 - Section 199.44 - 115th Ave. - Looking S. across channel - Channel is clear - Medium vegetation in left overbank

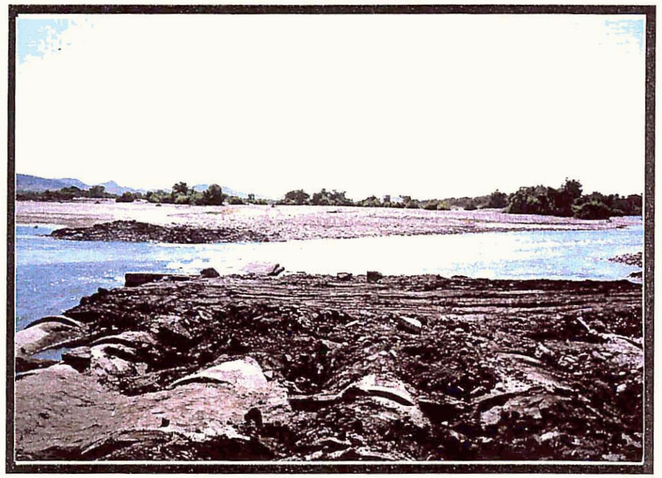


PHOTO 59 - Section 199.44 - 115th Ave. - Looking W. downstream along channel - Channel is clear with scattered vegetation

PHOTO 60 - Section 199.44 - 115th Ave. - Looking E. upstream at right overbank - Dense vegetation in overbank

CROSS-SECTION(S) : 202.29 ±

LOCATION : 91st Avenue crossing

CROSS-SECTION DESCRIPTION : Bed material consists of various sizes of river rock. The channel shape is slightly irregular. Channel contains light-medium density vegetation. Vegetation is medium density in overbanks and consists of grass, scrub, and trees; salt cedar.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Medium - Trees, bushes Semi-open	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.014$	**n = 0.043**
Light-medium - Sparse vegetation with some pockets of thicker vegetation	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.008$	**n = 0.037**
Agricultural - Cotton Fields		**n = 0.025**

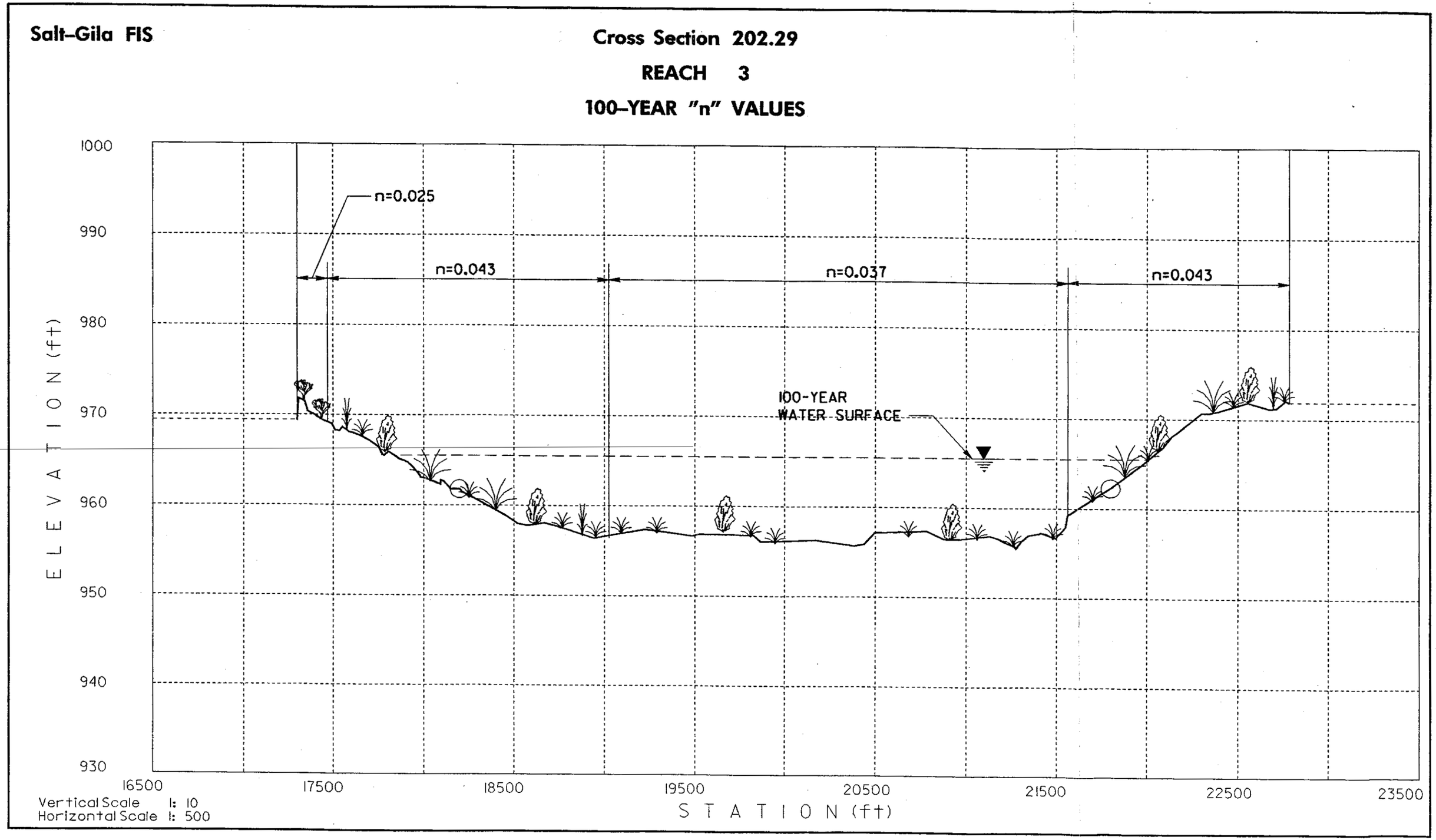


FIGURE 20 – 91st AVENUE ALIGNMENT

Baker
Michael Baker Jr., Inc.

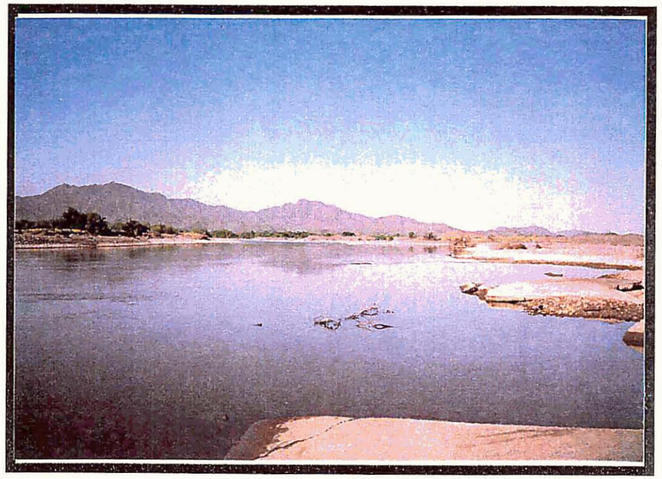


PHOTO 61 - Section 202.29 - 91st Ave - Looking W. downstream of 91st Ave - Light veg., at right overbank
Q = 3500 - 4000 cfs

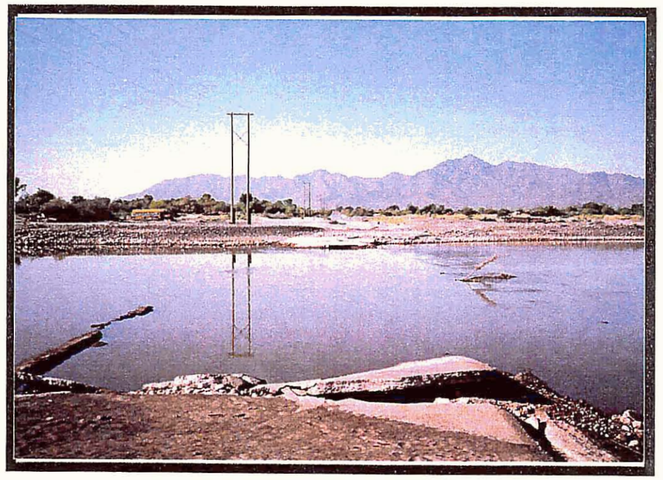


PHOTO 62 - Section 202.29 - 91st Ave Alignment - Looking S. across river at left overbank - Med. veg.
Q = 3500 - 4000 cfs

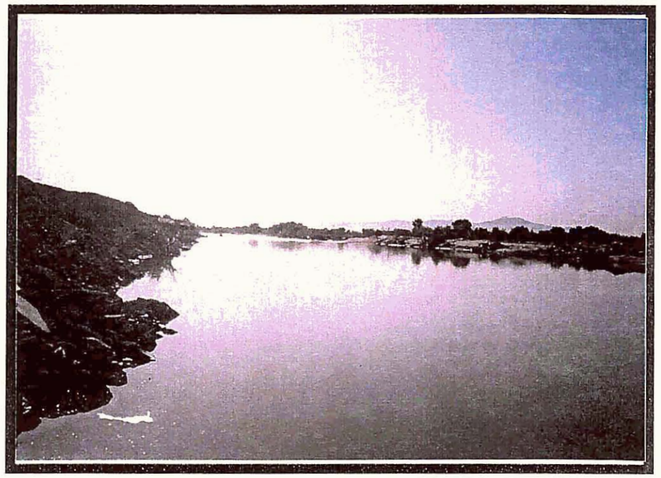


PHOTO 63 - Section 202.29 - 91st Ave - Looking E. upstream of 91st Ave - dike is at right bank (left in picture) - Effluent from 91st Ave WWTP on other side of dike
Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 205.40 ±

LOCATION : 67th Avenue crossing

CROSS-SECTION DESCRIPTION : Bed material consists of river rock and silt. The channel shape is slightly irregular. Channel is primarily clear of vegetation. Light and medium density vegetation exists in the left and right overbanks.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Medium - Trees, bushes Semi-open	$n_b = 0.025$	
	$n_1 = 0.004$	
	$n_2 = 0.000$	
	$n_3 = 0.014$	**n = 0.043**
Light - Sparse and/or small vegetation	$n_b = 0.025$	
	$n_1 = 0.003$	
	$n_2 = 0.000$	
	$n_3 = 0.004$	**n = 0.032**

Cross Section 205.40

REACH 3

100-YEAR "n" VALUES

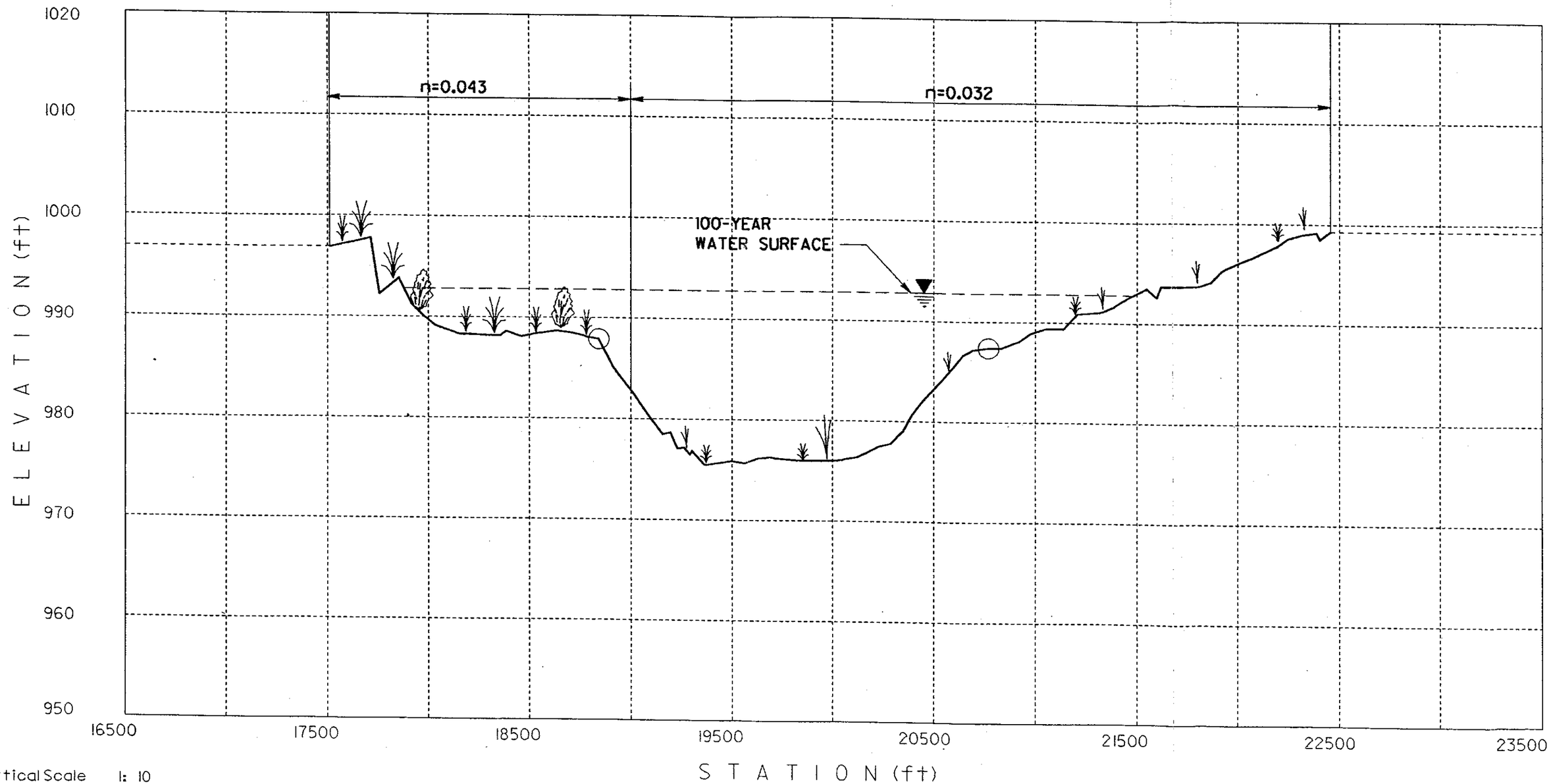


FIGURE 21 – 67th AVENUE ALIGNMENT

Baker
Michael Baker Jr., Inc.

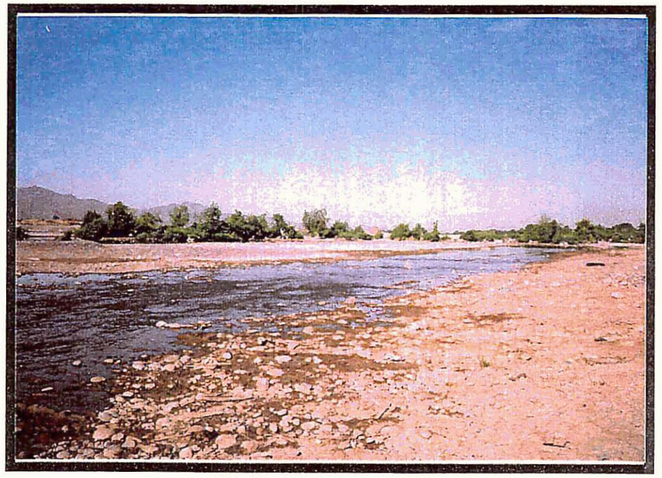


PHOTO 64 - Section 205.40 - 67th Ave - Looking W. downstream of 67th Ave - River rock along bottom
Q = 3500 - 4000 cfs

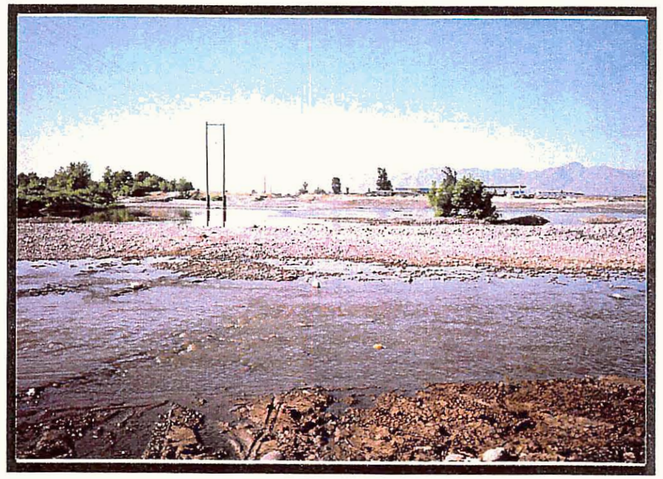


PHOTO 65 - Section 205.40 - 67th Ave Alignment - Looking S. across river at left overbank - Light - med veg. - River rock along bottom
Q = 3500 - 4000 cfs

PHOTO 66 - Section 205.40 - 67th Ave - Looking E. upstream of 67th Ave
Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 207.43 ±

LOCATION : 51st Avenue Bridge

CROSS-SECTION DESCRIPTION : Bed material is river rock and silt. Channel shape is slightly irregular. Vegetation is light and medium density in the left overbank and light in the right overbank. Channel is primarily clear.

100-YEAR N-VALUE CALCULATIONS

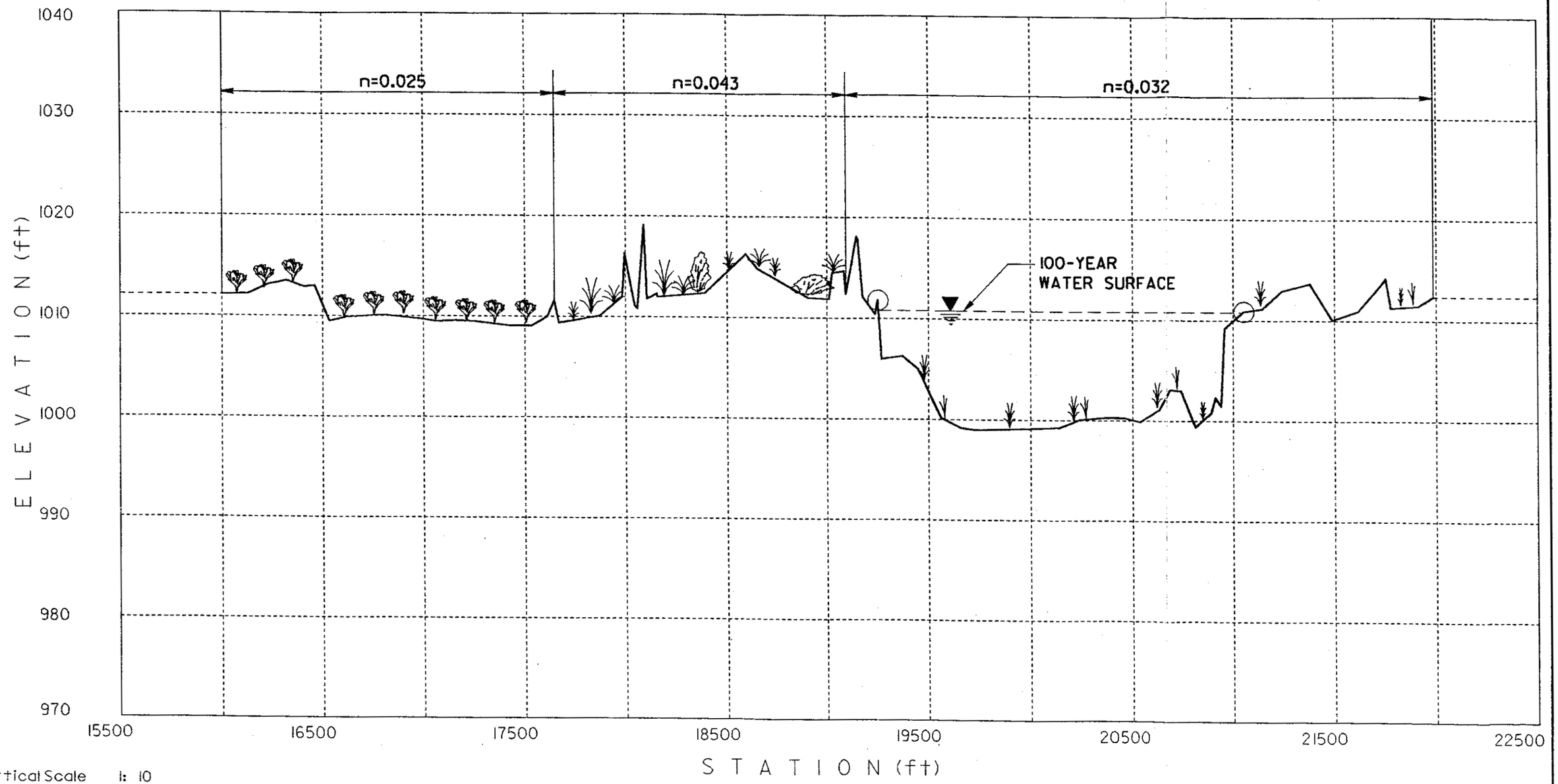
Portion of Cross Section	**Components**	**"n" Total**
Medium - Trees, bushes Semi-open	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.014$	**n = 0.043**
Light - Sparse and/or small vegetation	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**
Agricultural - Cotton Fields		**n = 0.025**

Salt-Gila FIS

Cross Section 207.43

REACH 3

100-YEAR "n" VALUES



Vertical Scale 1: 10
Horizontal Scale 1: 500

FIGURE 22 – 51st AVENUE BRIDGE

Baker
Michael Baker Jr., Inc.

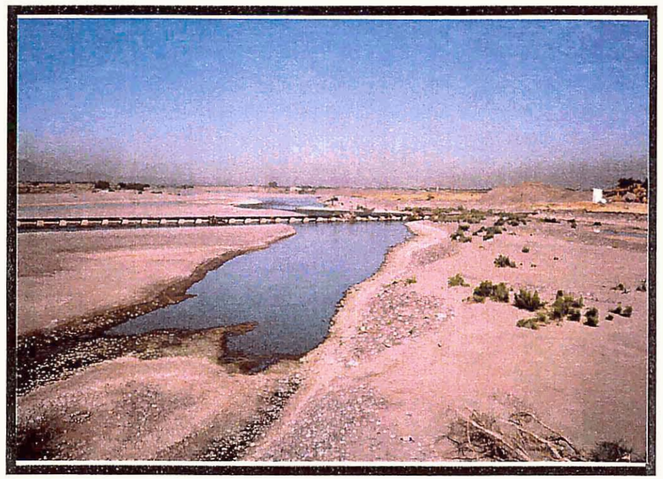


PHOTO 67 - Section 207.43 - 51st Ave Bridge - Looking W. downstream - Supported pipe crossing Light veg. in channel and overbanks
Q = 3500 - 4000 cfs

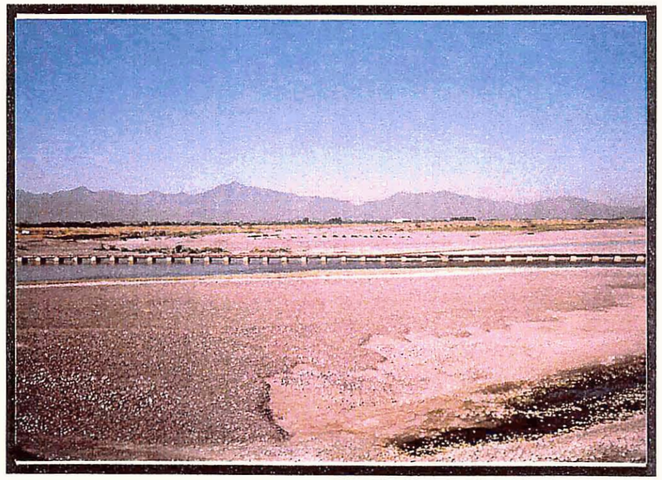


PHOTO 68 - Section 207.43 - 51st Ave - Looking W. downstream at pipeline
Q = 3500 - 4000 cfs

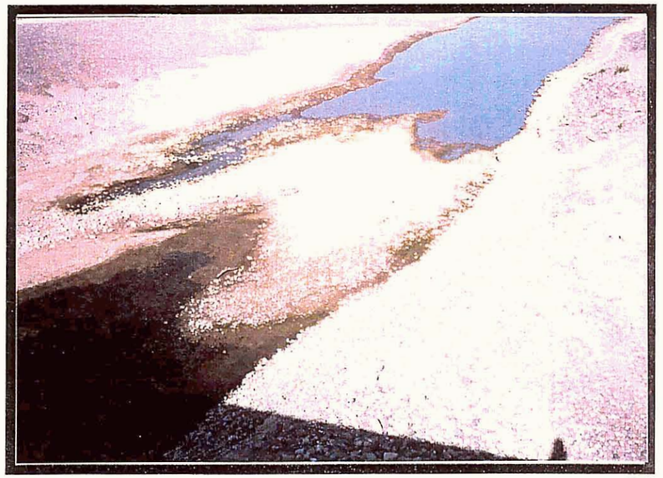


PHOTO 69 - Section 207.43 - 51st Ave - Looking downstream of bridge at river rock in channel
Q = 3500 - 4000 cfs

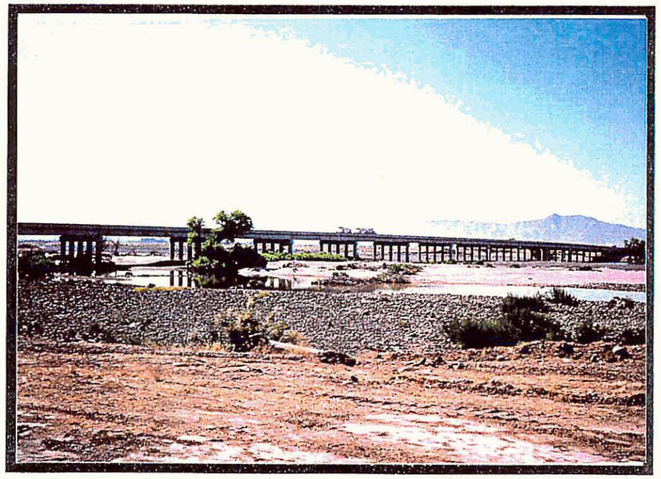


PHOTO 70 - Section 207.43 - 51st Ave Bridge - Looking E. upstream towards bridge Q = 3500 - 4000 cfs

PHOTO 71 - Section 207.43 - 51st Ave - Looking upstream of bridge at channel and right overbank Q = 3500 - 4000 cfs

PHOTO 72 - Section 207.43 - 51st Ave - Looking E. of bridge at gradation of river rock

CROSS-SECTION(S) : 209.79 ±

LOCATION : 35th Avenue Bridge

CROSS-SECTION DESCRIPTION : Bed material consists of river rock and silt. Channel shape is slightly irregular. Vegetation is light-medium density in left and right overbanks and consists primarily of grass and scrub. Channel is predominantly clear.

100-YEAR N-VALUE CALCULATIONS

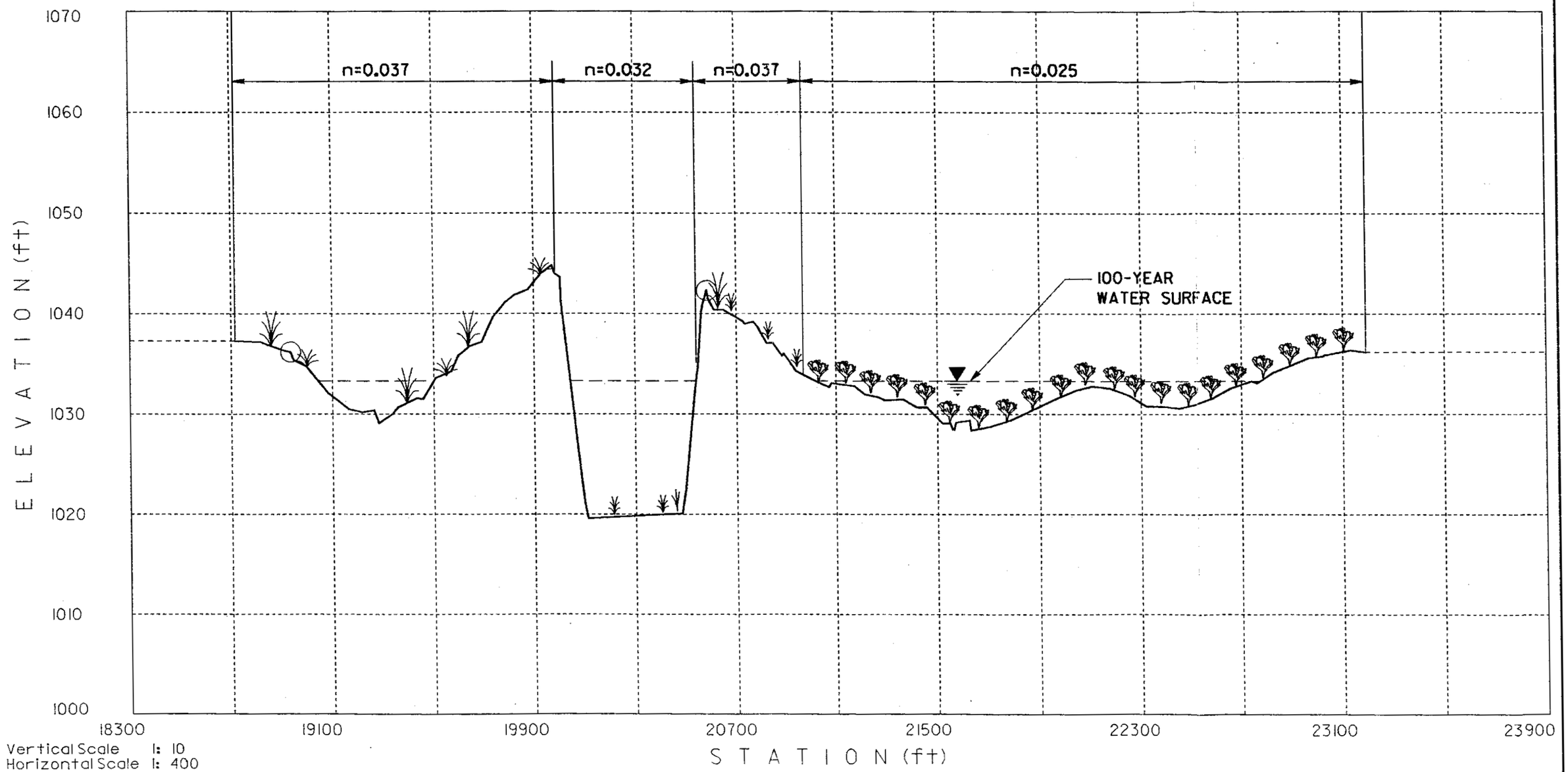
Portion of Cross Section	Components	"n" Total
Light-medium - Sparse vegetation with some pockets of thicker vegetation	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.008$	**n = 0.037**
Light - Sparse and/or small vegetation	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**
Agricultural - Cotton Fields		**n = 0.025**

Salt–Gila FIS

Cross Section 209.54

REACH 3

100–YEAR "n" VALUES



Vertical Scale 1: 10
Horizontal Scale 1: 400

FIGURE 23 – 35th AVENUE BRIDGE

Baker
Michael Baker Jr., Inc.

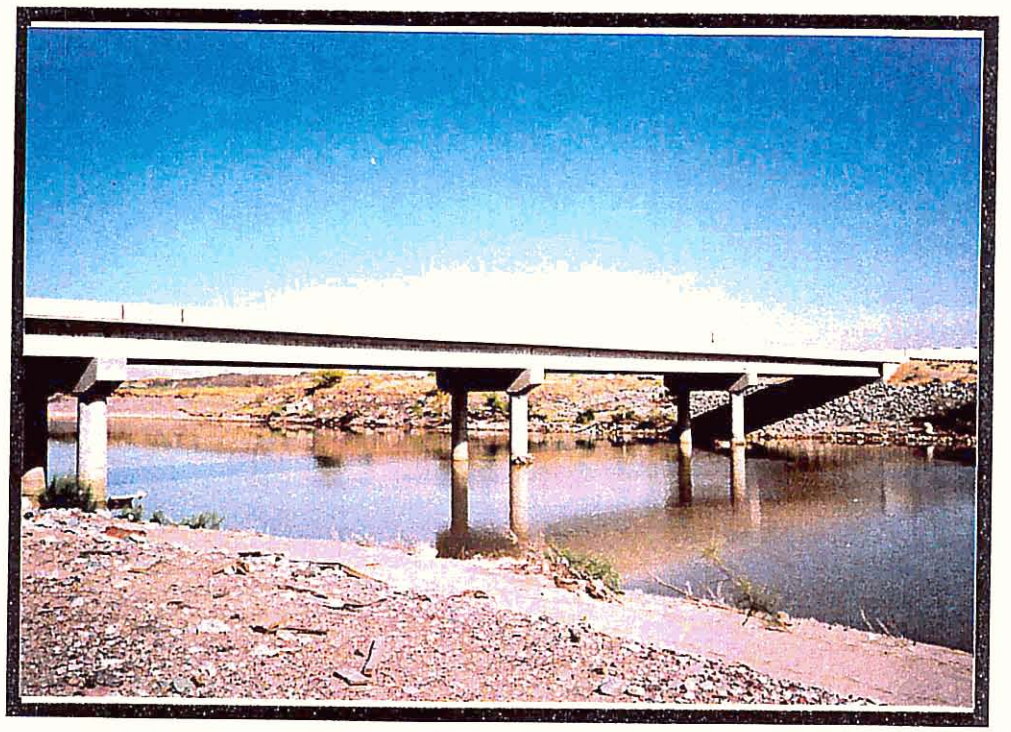


PHOTO 73 - Section 209.54 - 35th Ave Bridge - Looking W. downstream towards bridge - Bank protection under bridge Q = 3500 - 4000 cfs

PHOTO 74 - Section 209.54 - 35th Ave - Looking E. upstream - Bank protection along right bank (in background) Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 211.54 ±

LOCATION : 19th Avenue Bridge

CROSS-SECTION DESCRIPTION : Bed material is river rock and silt. Channel shape is slightly irregular. Vegetation is light-medium density in the left and right overbanks and consists of grass and scrub. Main channel is primarily clear.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.008$	**n = 0.037**
Channel	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**

Cross Section 211.54

REACH 3

100-YEAR "n" VALUES

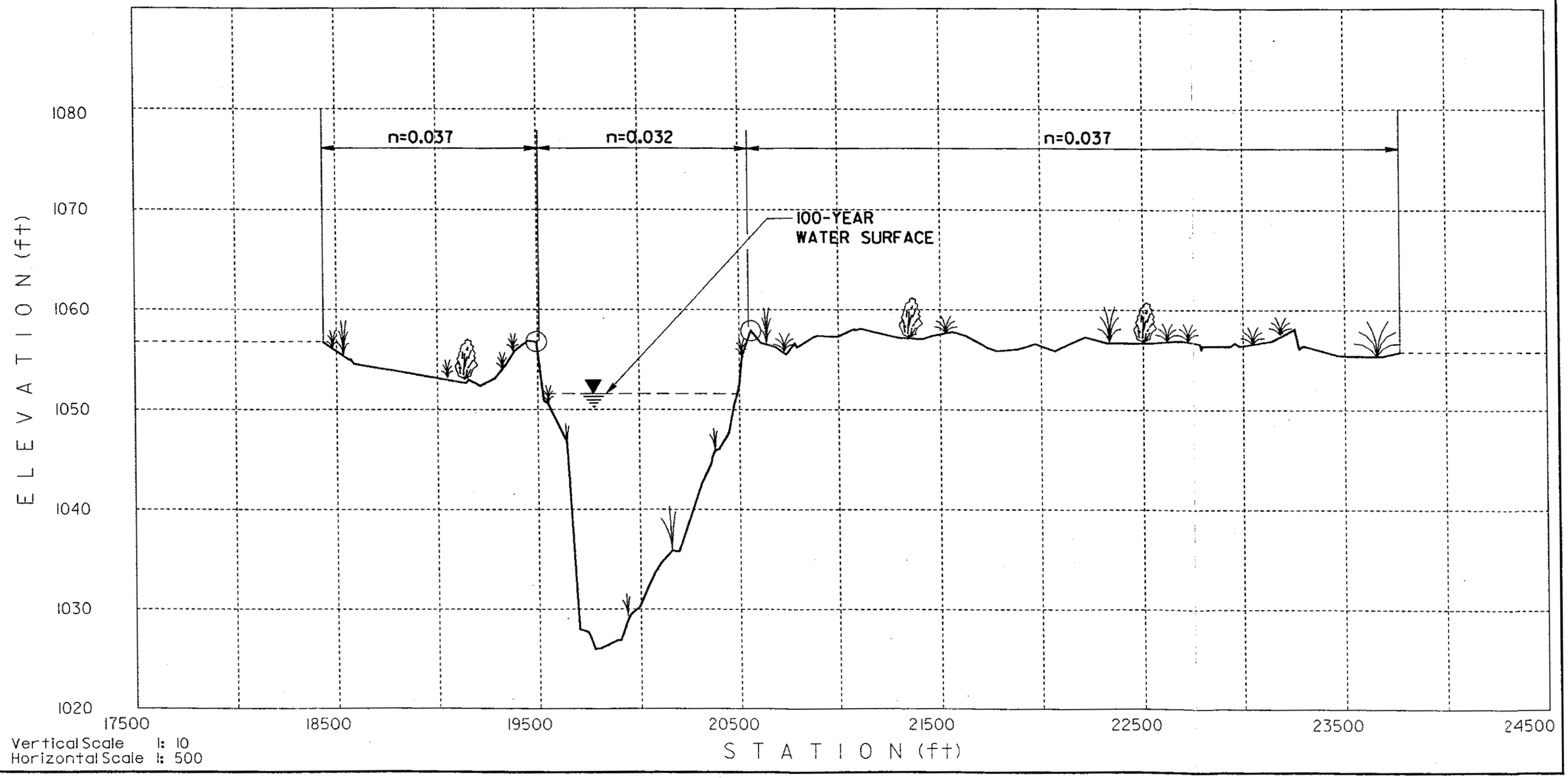


FIGURE 24 – 19th AVENUE BRIDGE

Baker
Michael Baker Jr., Inc.

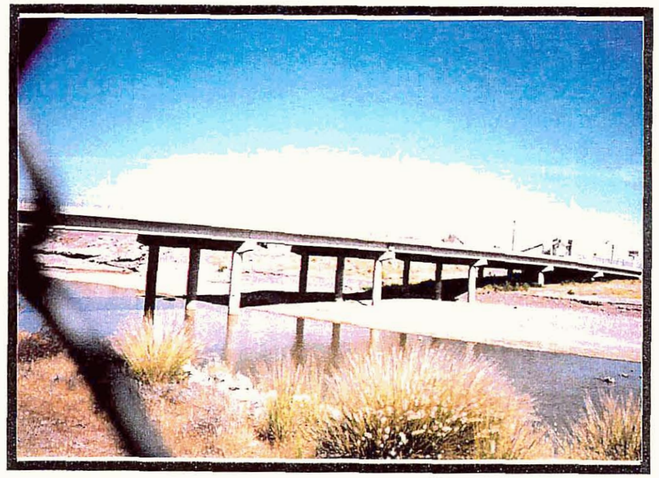


PHOTO 75 - Section 211.54 - 19th Ave Bridge - Looking W. downstream at bridge - Bank protection on S. side of river (foreground) Q = 3500 - 4000 cfs

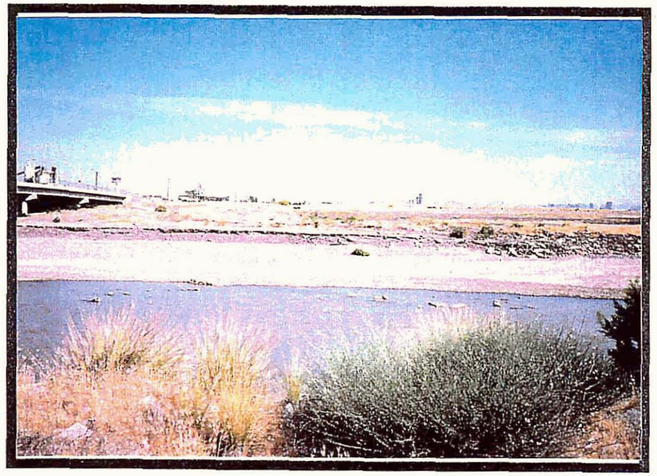


PHOTO 76 - Section 211.54 - 19th Ave - Looking N. across river, E. of bridge - Eroded bank on N. side Q = 3500 - 4000 cfs

PHOTO 77 - Section 211.54 - 19th Ave - Looking E. upstream of bridge Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 212.69 ±

LOCATION : 7th Avenue Bridge

CROSS-SECTION DESCRIPTION : Bed material consists of river rock and silt. Channel shape is slightly irregular. Vegetation is light-medium density in left and right overbanks. Channel is primarily clear with some scattered vegetation.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.008$	**n = 0.037**
Channel	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**

Cross Section 212.69

REACH 3

100–YEAR "n" VALUES

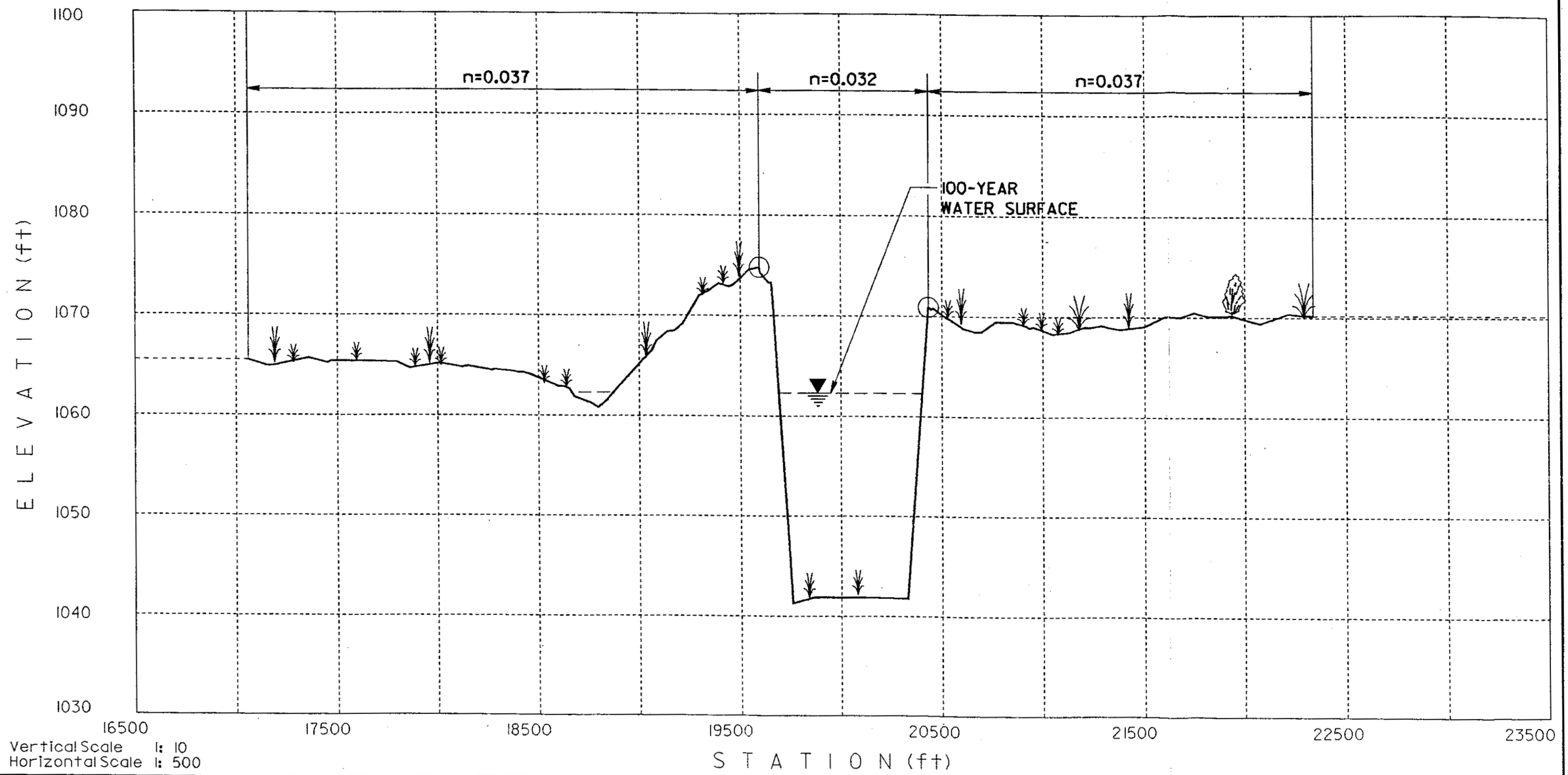


FIGURE 25 – 7th AVENUE BRIDGE

Baker
Michael Baker Jr., Inc.

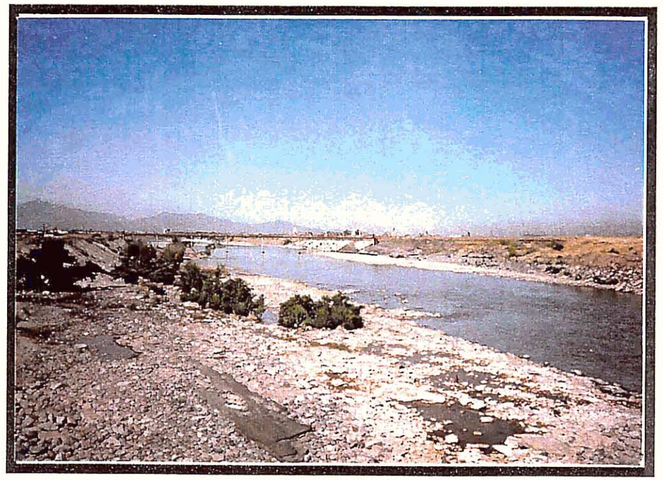


PHOTO 78 - Section 212.69 - 7th Ave - Looking W. downstream of bridge - View of bank protection on N. bank downstream Q = 3500 - 4000 cfs

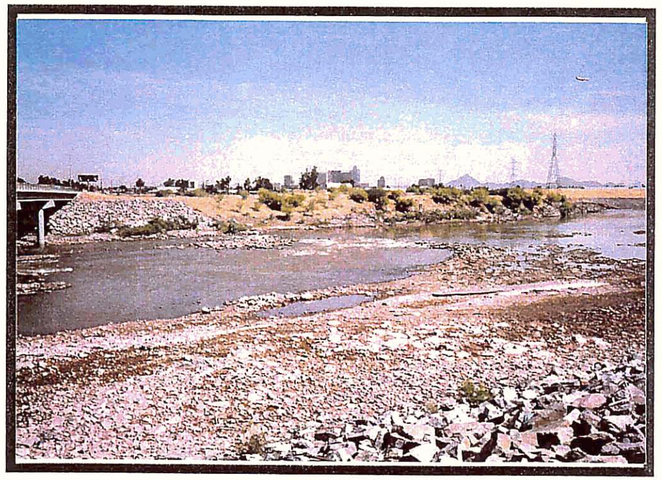


PHOTO 79 - Section 212.69 - 7th Ave - Looking N. across river - Bank protection under bridge Q = 3500 - 4000 cfs

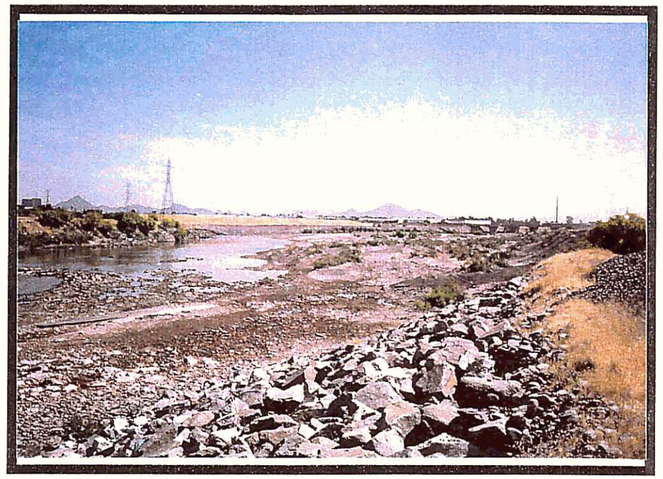


PHOTO 80 - Section 212.69 - 7th Ave - Looking E. upstream - Light veg. in channel - Bank protection on S. bank Q = 3500 - 4000 cfs

PHOTO 81 - Section 212.69 - 7th Ave - Looking W. downstream of bridge at gradation of channe Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 213.27 ±

LOCATION : Central Avenue Bridge

CROSS-SECTION DESCRIPTION : Bed material consists of river rock and silt. Channel shape is slightly irregular. Scattered vegetation is within channel. Vegetation in left and right overbanks is light-medium density - grass, scrub.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.008$	**n = 0.037**
Channel	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**

Cross Section 213.27

REACH 3

100–YEAR "n" VALUES

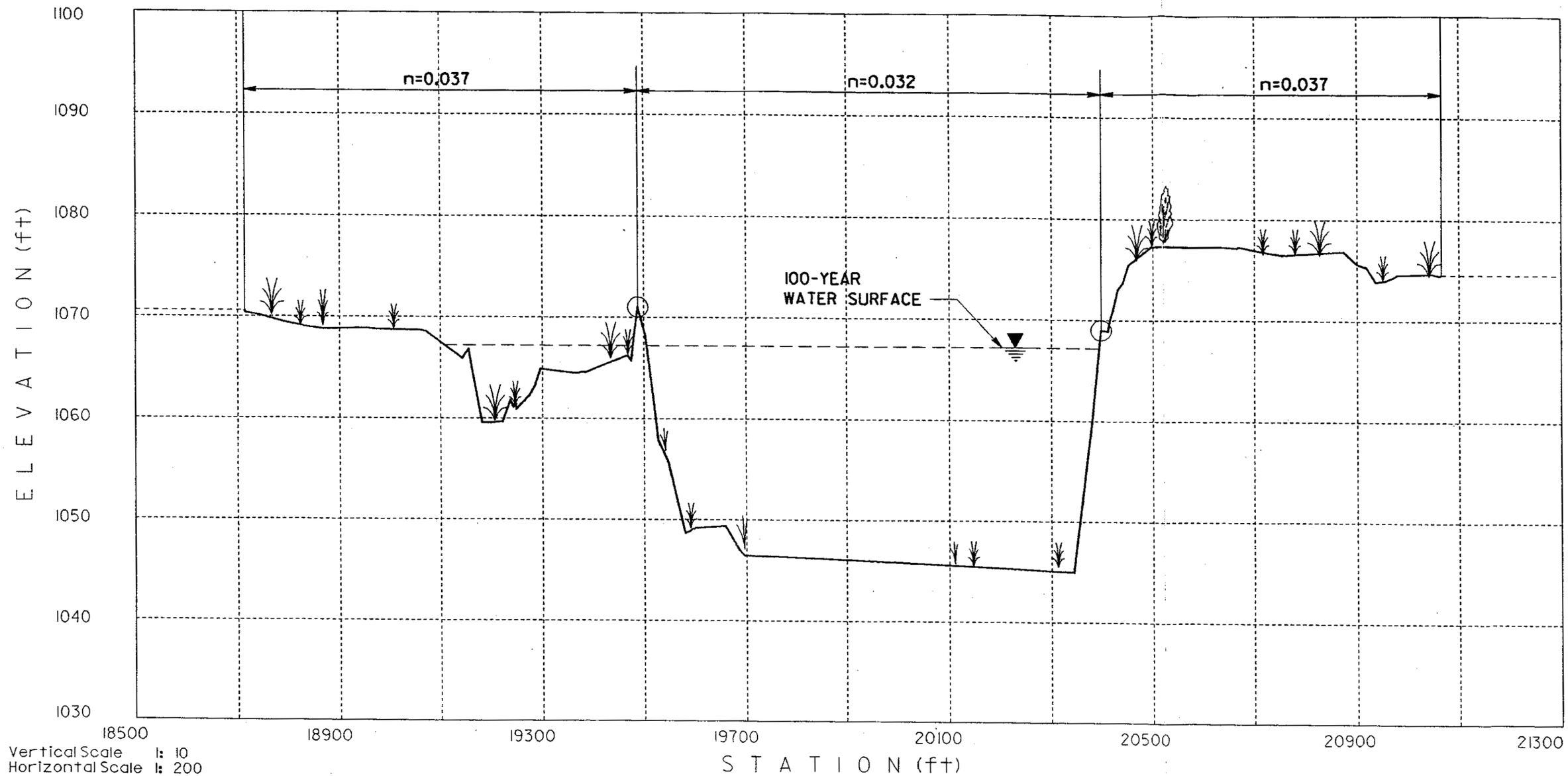


FIGURE 26 – CENTRAL AVENUE BRIDGE

Baker
Michael Baker Jr., Inc.

PHOTO 82 - Section 213.27 - Central Ave Bridge - Looking N.W. at bridge downstream towards bridge Q = 3500 - 4000 cfs

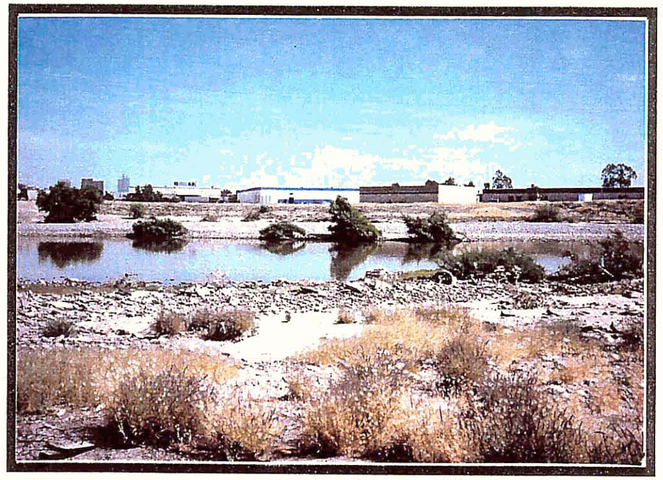


PHOTO 83 - Section 213.27 - Central Ave - Looking N. across river, E. of bridge Q = 3500 - 4000 cfs

PHOTO 84 - Section 213.27 - Central Ave - Looking E. upstream towards 7th St Bridge - Debris along S. bank Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 213.73 ±

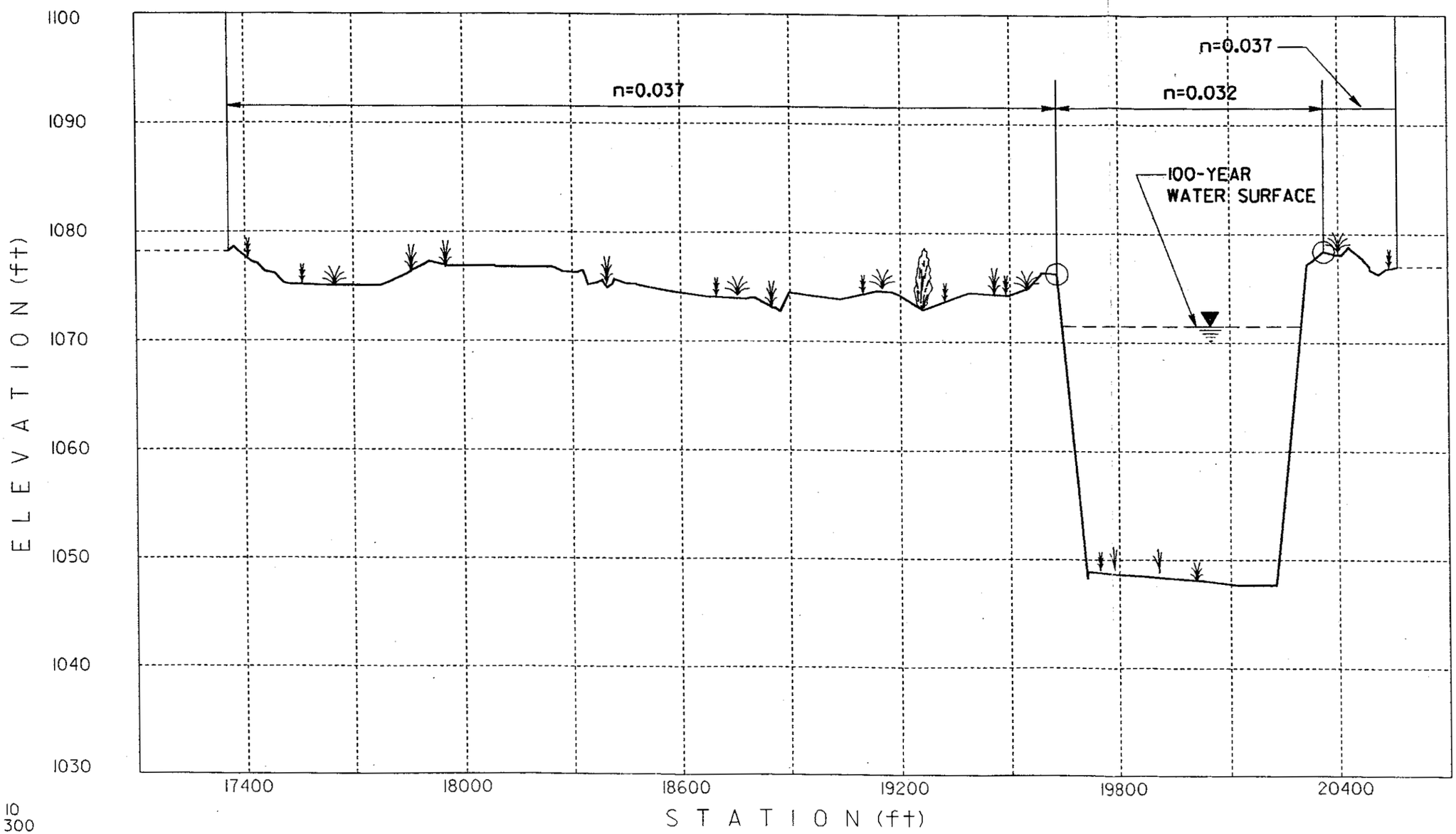
LOCATION : 7th Street Bridge

CROSS-SECTION DESCRIPTION : Bed material is silt and river rock. Channel shape is slightly irregular. Clear to light-medium density vegetation in left and right overbanks. Channel is primarily clear with some scattered vegetation.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.004$ $n_2 = 0.000$ $n_3 = 0.008$	**n = 0.037**
Channel	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**

Cross Section 213.73
REACH 3
100–YEAR "n" VALUES



Vertical Scale 1: 10
Horizontal Scale 1: 300

FIGURE 27 – 7th STREET BRIDGE

Baker
Michael Baker Jr., Inc.

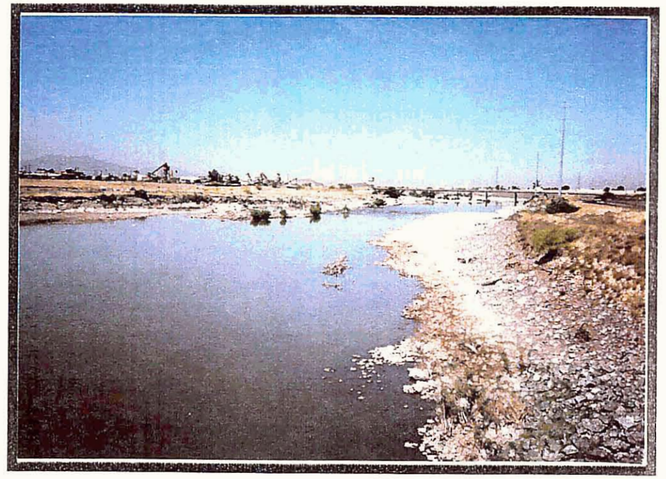


PHOTO 85 - Section 213.73 - 7th St - Looking W. downstream towards Central Ave Q = 3500 - 4000 cfs

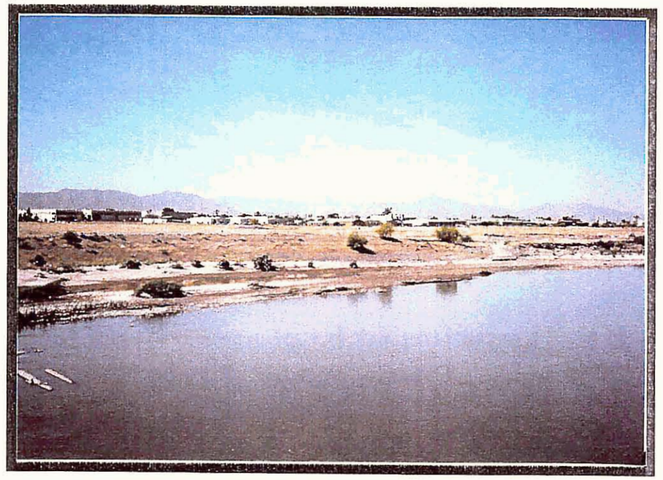


PHOTO 86 - Section 213.73 - 7th St - Looking S. from bridge across river - Light veg. or bare in left overbank Q = 3500 - 4000 cfs

PHOTO 87 - Section 213.73 - 7th St - Looking E. upstream - Bank protection along N. and S. banks Q = 3500 - 4000 cfs

PHOTO 88 - Section 213.73 - 7th St - Looking S. from bridge across river - Light veg. in overbank Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 214.71 ±

LOCATION : 16th Street Bridge

CROSS-SECTION DESCRIPTION : Bed material consists of silt and river rock. Channel shape is slightly irregular. Channel banks are gabion - lined. Light-medium vegetation exists in left and right overbanks. Channel is generally clear.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.006$ $n_2 = 0.000$ $n_3 = 0.009$	**n = 0.040**
Channel	$n_b = 0.025$ $n_1 = 0.006$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.035**

Cross Section 214.71

REACH 4

100–YEAR "n" VALUES

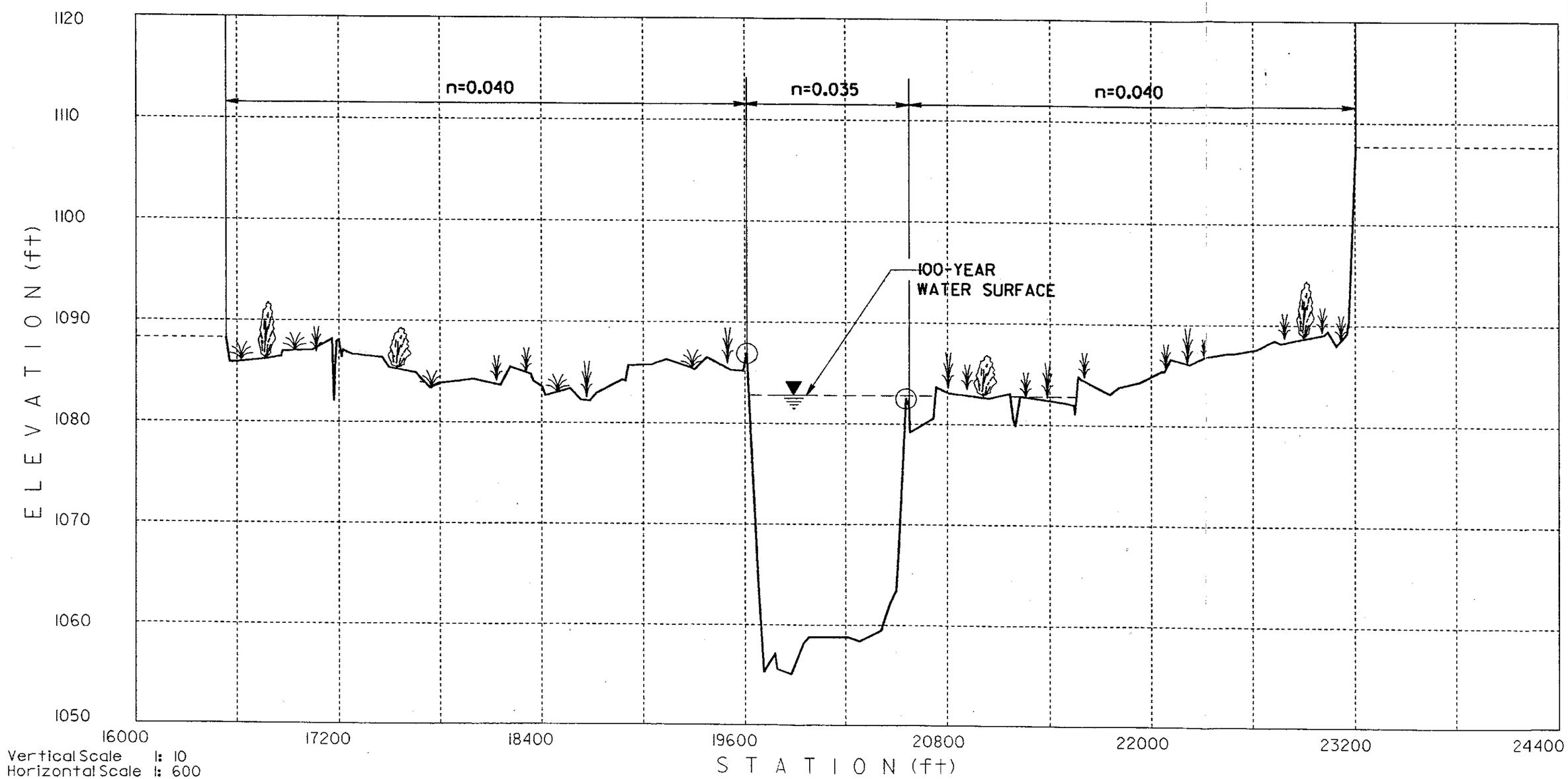


FIGURE 28 – 16th STREET BRIDGE

Baker
Michael Baker Jr., Inc.

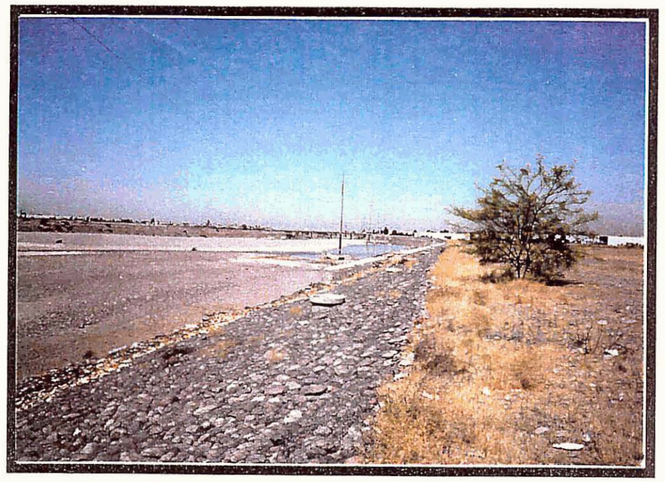


PHOTO 89 - Section 214.71 - 16th St - Looking W. downstream from bridge - Bank protection along N. bank Q = 3500 - 4000 cfs

PHOTO 90 - Section 214.71 - 16th St - Looking S. across river, W. of bridge - Culvert opening in bank Q = 3500 - 4000 cfs

PHOTO 91 - Section 214.71 - 16th St Bridge - Looking E. upstream at bridge - Channel along S. bank Q = 3500 - 4000 cfs

PHOTO 92 - Section 214.71 - 16th St - View of gabion bank protection along N. bank

CROSS-SECTION(S) : 215.82 ±

LOCATION : 24th Street Bridge

CROSS-SECTION DESCRIPTION : Bed material consists of silt and river rock. Channel shape is slightly irregular. Channel is primarily clear of vegetation. Light-medium density vegetation in left and right overbanks - generally grass.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.006$ $n_2 = 0.000$ $n_3 = 0.009$	**n = 0.040**
Channel	$n_b = 0.025$ $n_1 = 0.006$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.035**

Cross Section 215.80
REACH 4
100-YEAR "n" VALUES

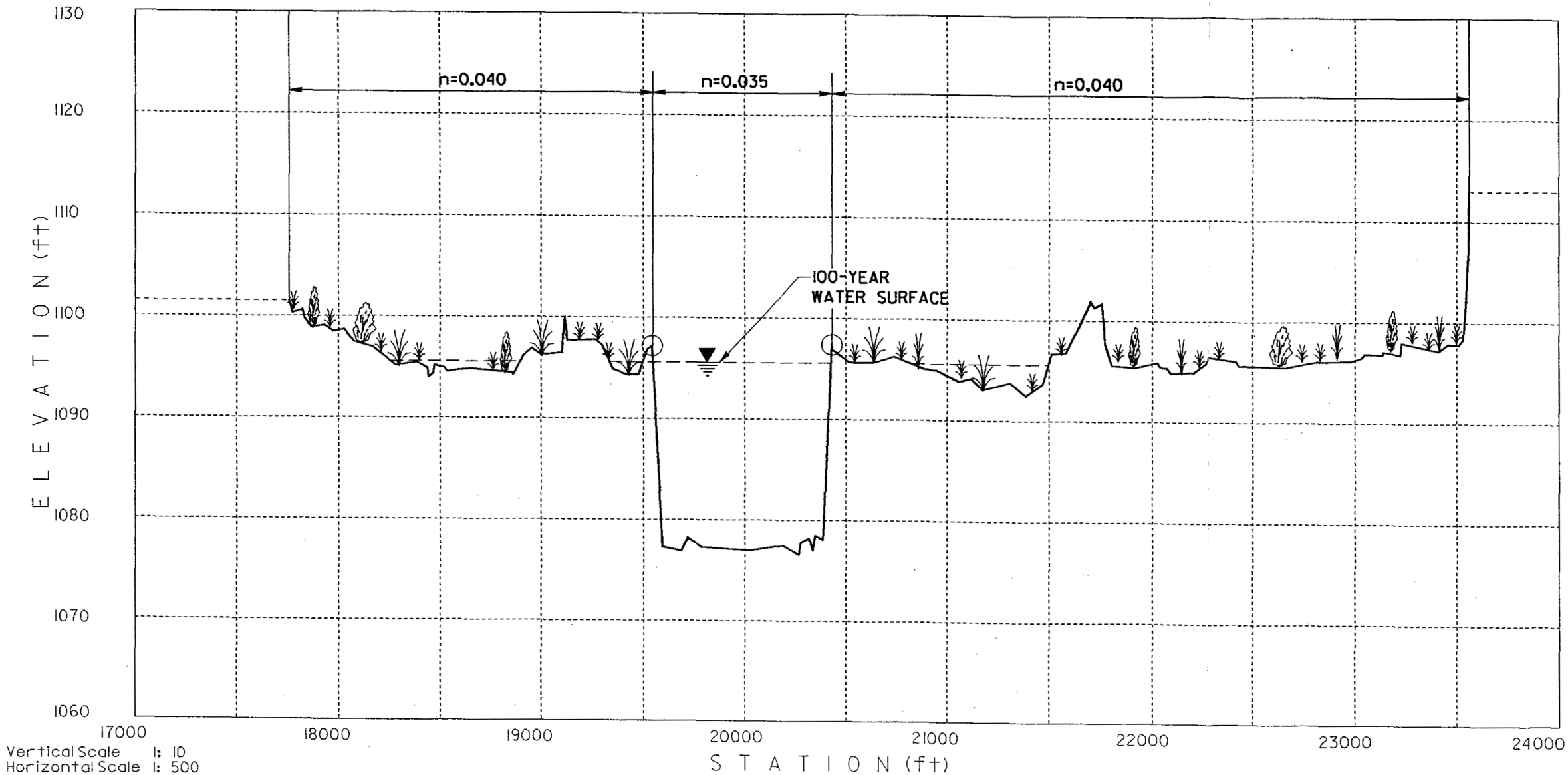


FIGURE 29 – 24th STREET BRIDGE

Baker
Michael Baker Jr., Inc.

PHOTO 93 - Section 215.82 - 24th St - Looking W. downstream from bridge - River rock in channel Q = 3500 - 4000 cfs

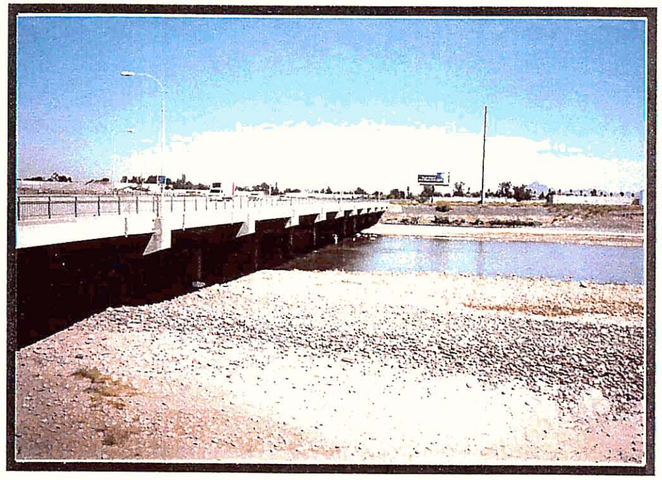


PHOTO 94 - Section 215.82 - 24th St Bridge - Looking N. at bridge Q = 3500 - 4000 cfs

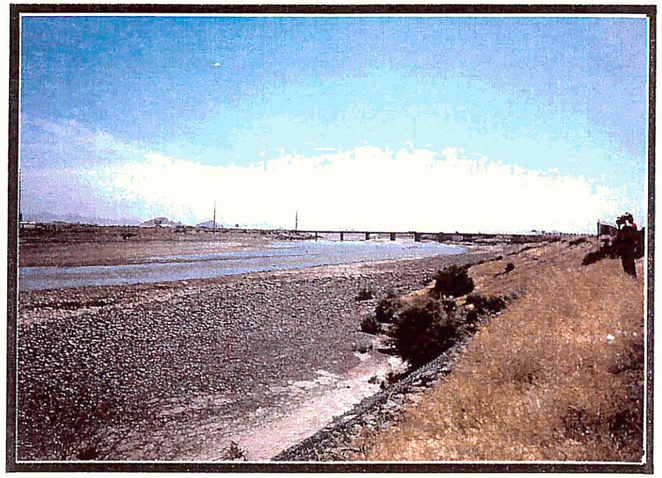


PHOTO 95 - Section 215.82 - 24th St - Looking E. upstream of 24th St Q = 3500 - 4000 cfs

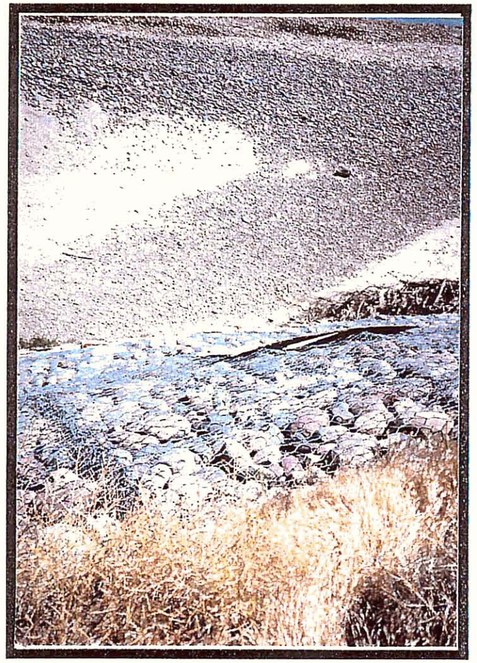


PHOTO 96 - Section 215.82 - 24th St - Bank protection along S.

CROSS-SECTION(S) : 216.53 ±

LOCATION : East of I-10 Bridge

CROSS-SECTION DESCRIPTION : Bed material consists of silt and river rock. Channel shape is slightly irregular. Channel is primarily clear. Channel banks are gabion - lined. Overbanks are light-medium density vegetation.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.006$ $n_2 = 0.000$ $n_3 = 0.009$	**n = 0.040**
Channel	$n_b = 0.025$ $n_1 = 0.006$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.035**

Cross Section 216.53

REACH 4

100–YEAR "n" VALUES

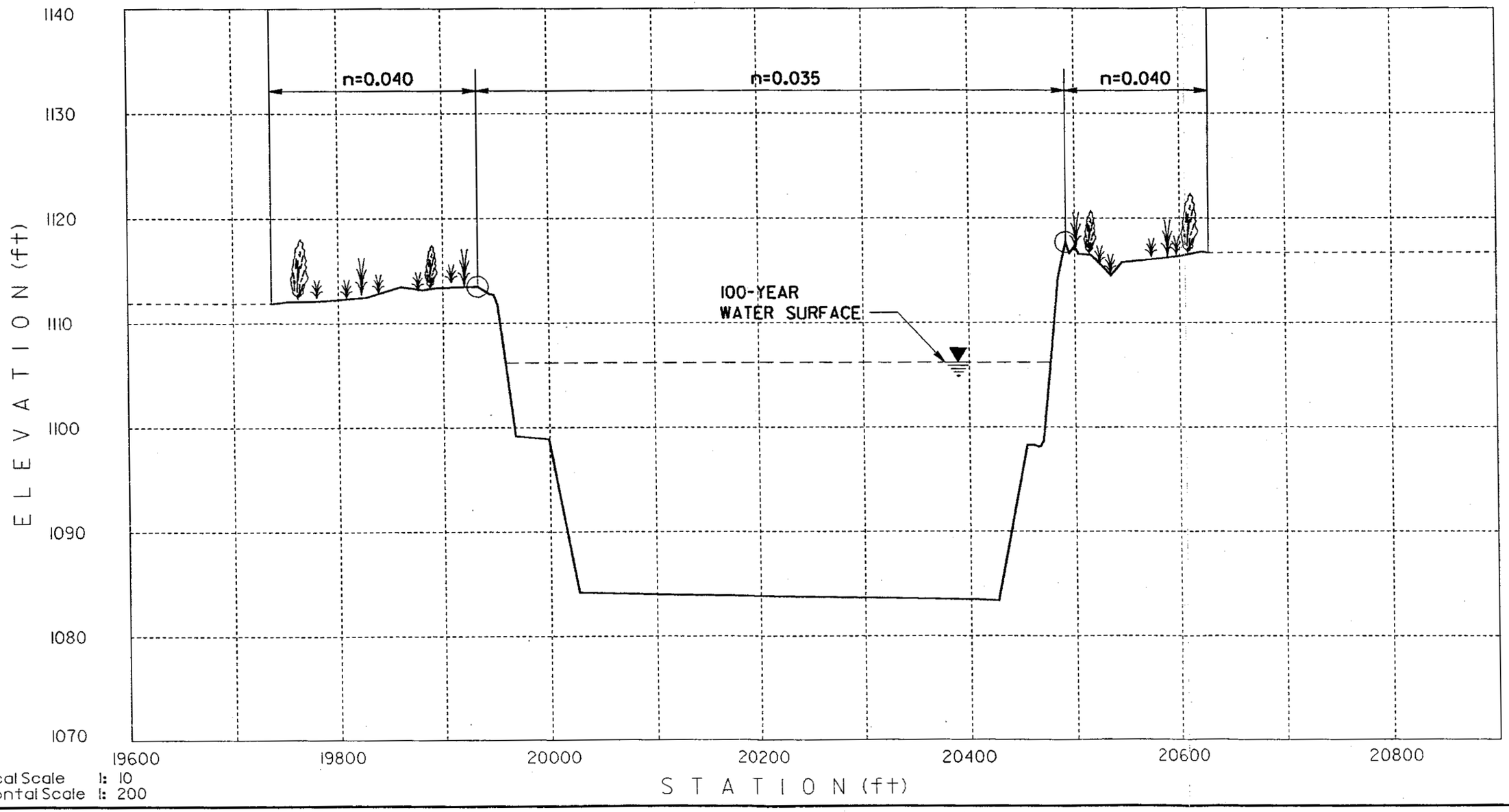


FIGURE 30 – I–10 BRIDGE

Baker
Michael Baker Jr., Inc.

PHOTO 97 - Section 216.53 - I-10 Bridge - Looking W. at bridge - Veg. in channel Q = 3500 - 4000 cfs

PHOTO 98 - Section 216.53 - I-10 Bridge - Looking N. at right bank across river - Airport in background - Bank protection along N. bank Q = 3500 - 4000 cfs

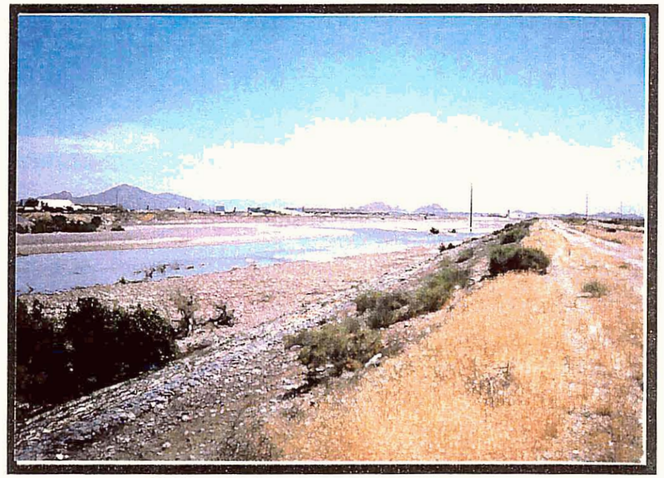


PHOTO 99 - Section 216.53 - I-10 Bridge - Looking E. upstream from bridge - Airport on N. bank Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 217.57 ±

LOCATION : 32nd Street alignment

CROSS-SECTION DESCRIPTION : Bed material is silt/sand and river rock. Channel shape is slightly irregular. Channel is primarily clear with some scattered vegetation. Left and right overbanks contains light-medium density vegetation.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.006$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.035**
Channel	$n_b = 0.025$ $n_1 = 0.006$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.035**

Cross Section 217.57

REACH 4

100–YEAR "n" VALUES

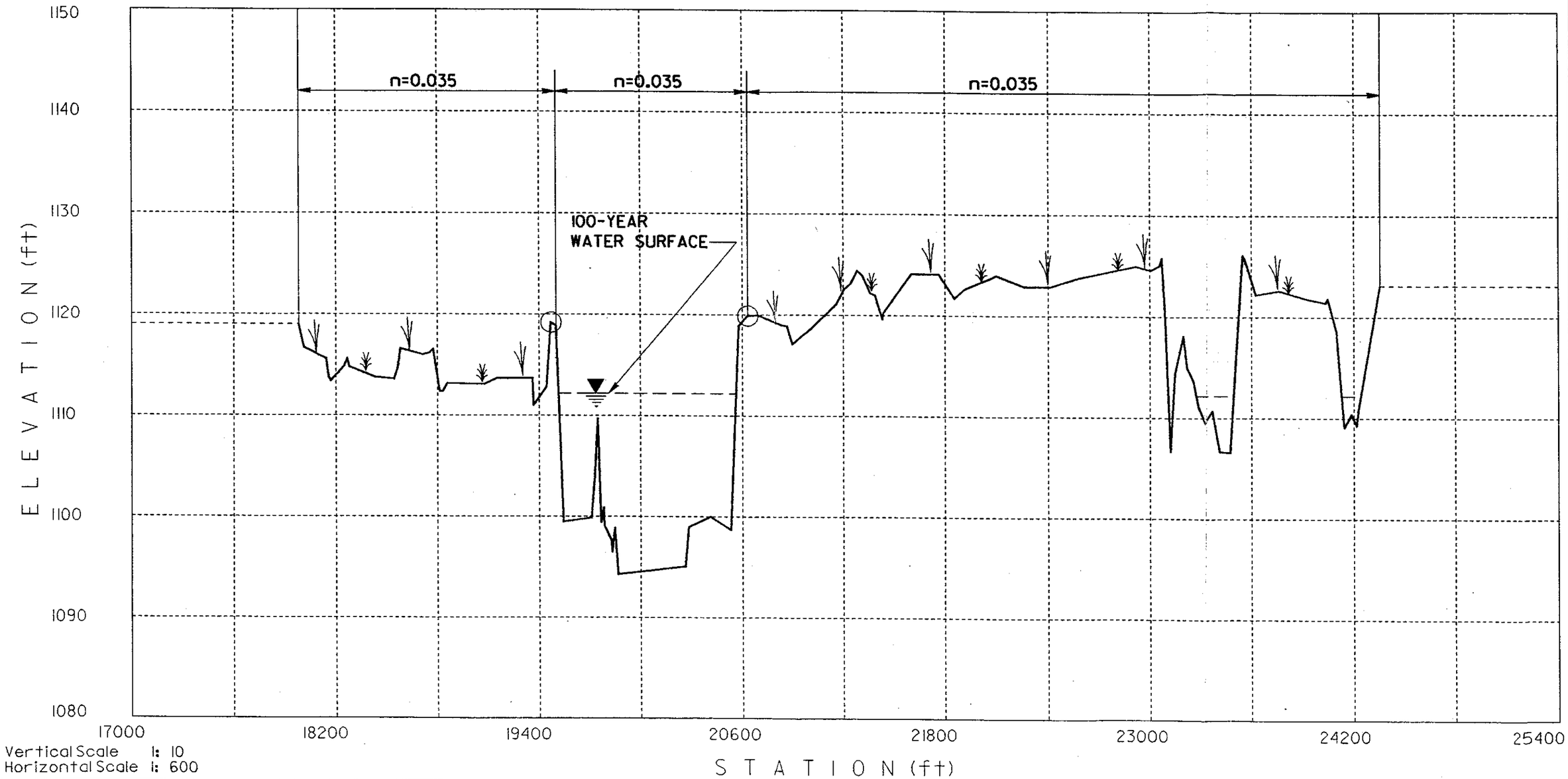


FIGURE 31 – 32nd STREET ALIGNMENT

Baker
Michael Baker Jr., Inc.

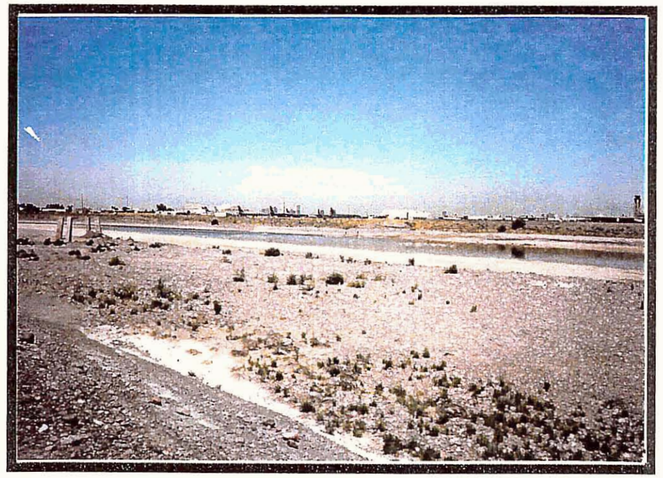


PHOTO 100 - Section 217.57 - Approx. 32nd St Alignment - Looking W. downstream Q = 3500 - 4000 cfs

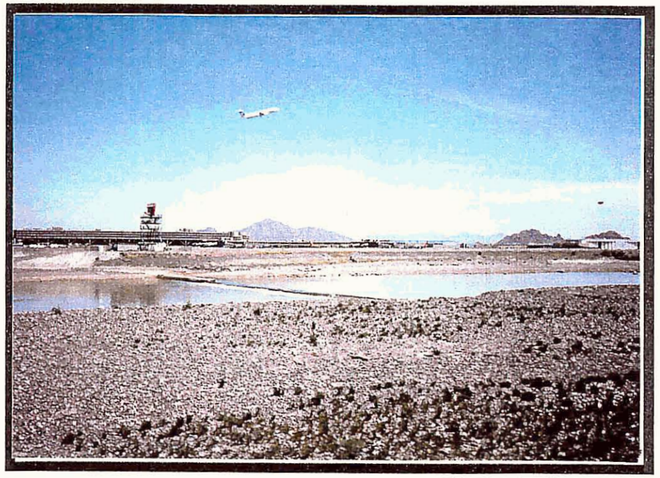


PHOTO 101 - Section 217.57 - Approx. 32nd St Alignment - Looking N., flood control structure across river - Airport on N. bank Q = 3500 - 4000 cfs

PHOTO 102 - Section 217.57 - Approx. 32nd St Alignment - Looking E. upstream towards Hohokam Bridge - Light veg. in channelQ = 3500 - 4000 cfs

CROSS-SECTION(S) : 219.04 ±

LOCATION : Hohokam Expressway Bridge

CROSS-SECTION DESCRIPTION : Bed material is silt and river rock. Channel shape is slightly irregular. Channel is primarily clear with scattered vegetation. Left and right overbanks contain medium vegetation.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.015$ $n_2 = 0.000$ $n_3 = 0.010$	**n = 0.050**
Channel	$n_b = 0.025$ $n_1 = 0.006$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.035**

Cross Section 219.04

REACH 4

100–YEAR "n" VALUES

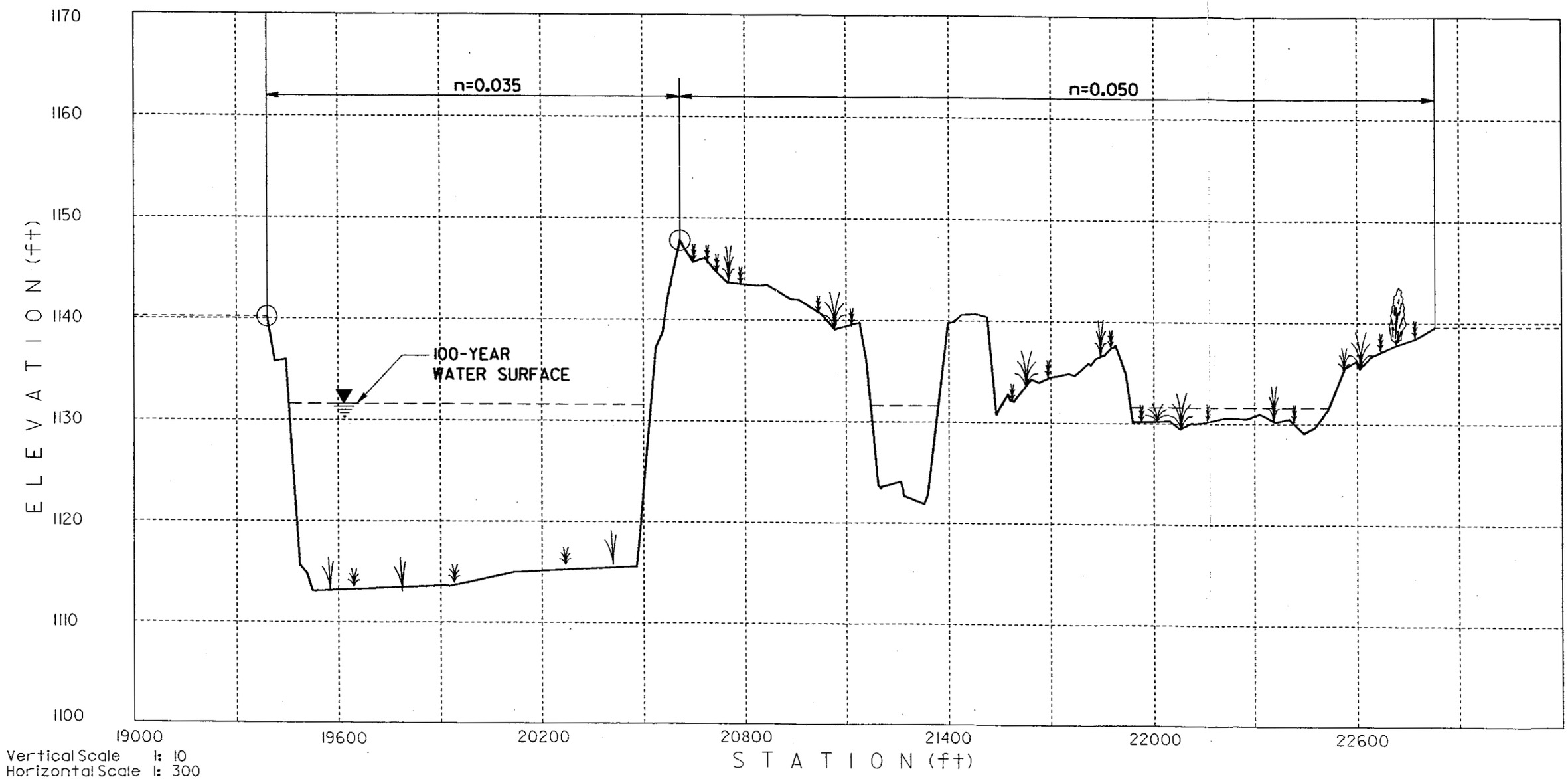


FIGURE 32 – HOHOKAM EXPRESSWAY BRIDGE

Baker
Michael Baker Jr., Inc.

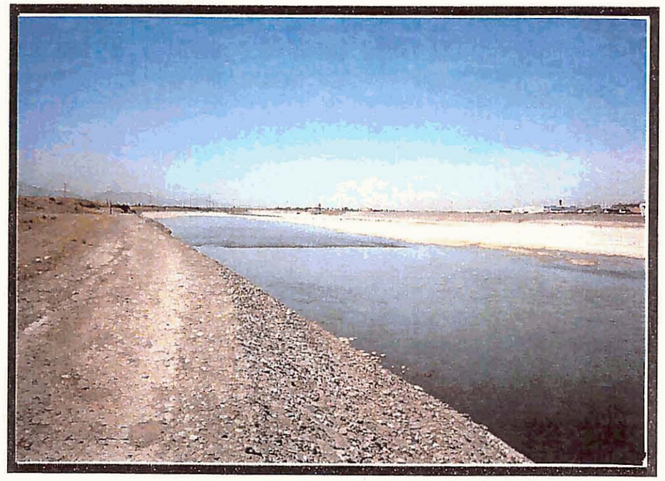


PHOTO 103 - Section 219.04 - Hohokam Bridge - Looking W. downstream from bridge, upstream of drop structure
Q = 3500 - 4000 cfs

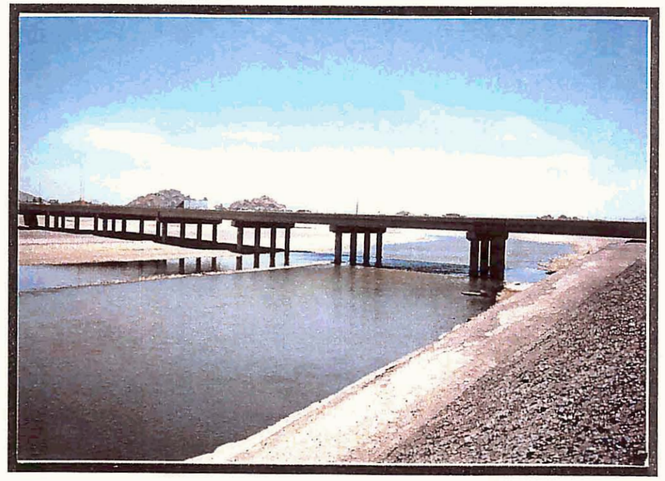


PHOTO 104 - Section 219.04 - Hohokam Bridge - Looking E. at bridge
Q = 3500 - 4000 cfs

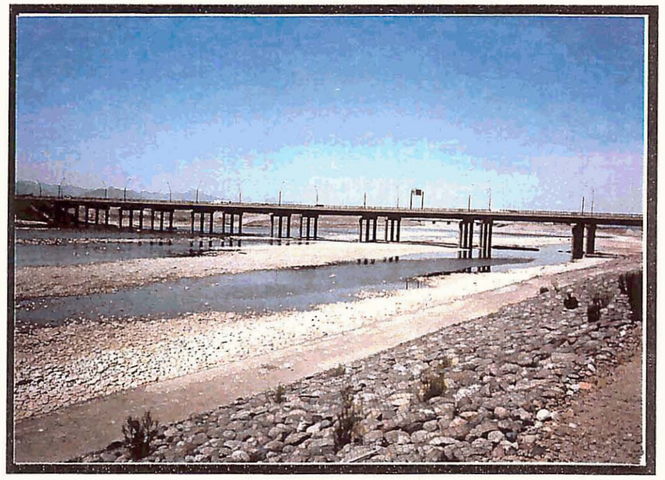


PHOTO 105 - Section 219.04 - Hohokam Bridge - Looking W. at bridge from N. bank - Bank protection along N. bank
Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 219.24 - 219.51

LOCATION : East of Hohokam Expressway Bridge; approx. alignment of Priest Drive

CROSS-SECTION DESCRIPTION : *Bed material is silt and river rock. Channel shape is* slightly irregular. The channel banks are tiered. The upper tier is gabion - lined. Left and right overbanks contain light vegetation.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	**Components**	**"n" Total**
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.006$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.035**
Channel	$n_b = 0.025$ $n_1 = 0.006$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.035**

Cross Section 219.51

REACH 4

100–YEAR "n" VALUES

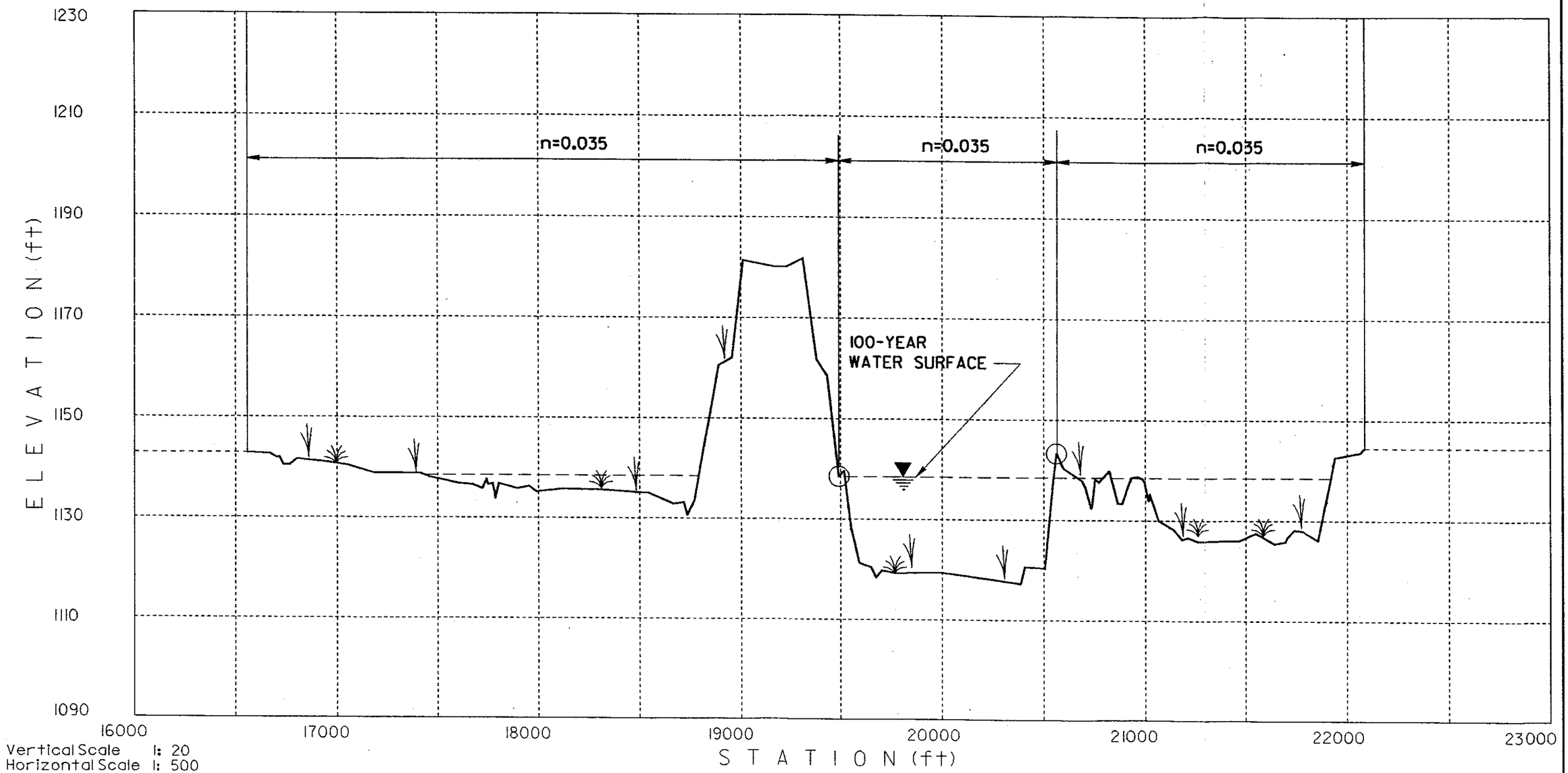


FIGURE 33 – EAST OF HOHOKAM EXPRESSWAY BRIDGE

Baker
Michael Baker Jr., Inc.

PHOTO 106 - Section 219.24 - Hohokam Bridge - Looking E. upstream from N. bank towards R.R. bridge in Tempe - Bank protection Q = 3500 - 4000 cfs

PHOTO 107 - Section 219.24 - Hohokam Bridge - Tiered bank protection along N. bank - Looking E. towards Tempe upstream Q = 3500 - 4000 cfs

PHOTO 108 - Section 219.24 - Hohokam Bridge - Looking S. across river, upstream (E.) of bridge Q = 3500 - 4000 cfs

PHOTO 109 - Section 219.51 - Between Tempe R.R. bridge and Hohokam Bridge - Looking S. across river at drop structure Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 222.10 - 222.74

LOCATION : *East of Rural Road Bridge*

CROSS-SECTION DESCRIPTION : Bed material is silt and river rock. Channel shape is slightly irregular. Channel is primarily clear and channel banks are lightly vegetated. Left and right overbanks contain light-medium vegetation.

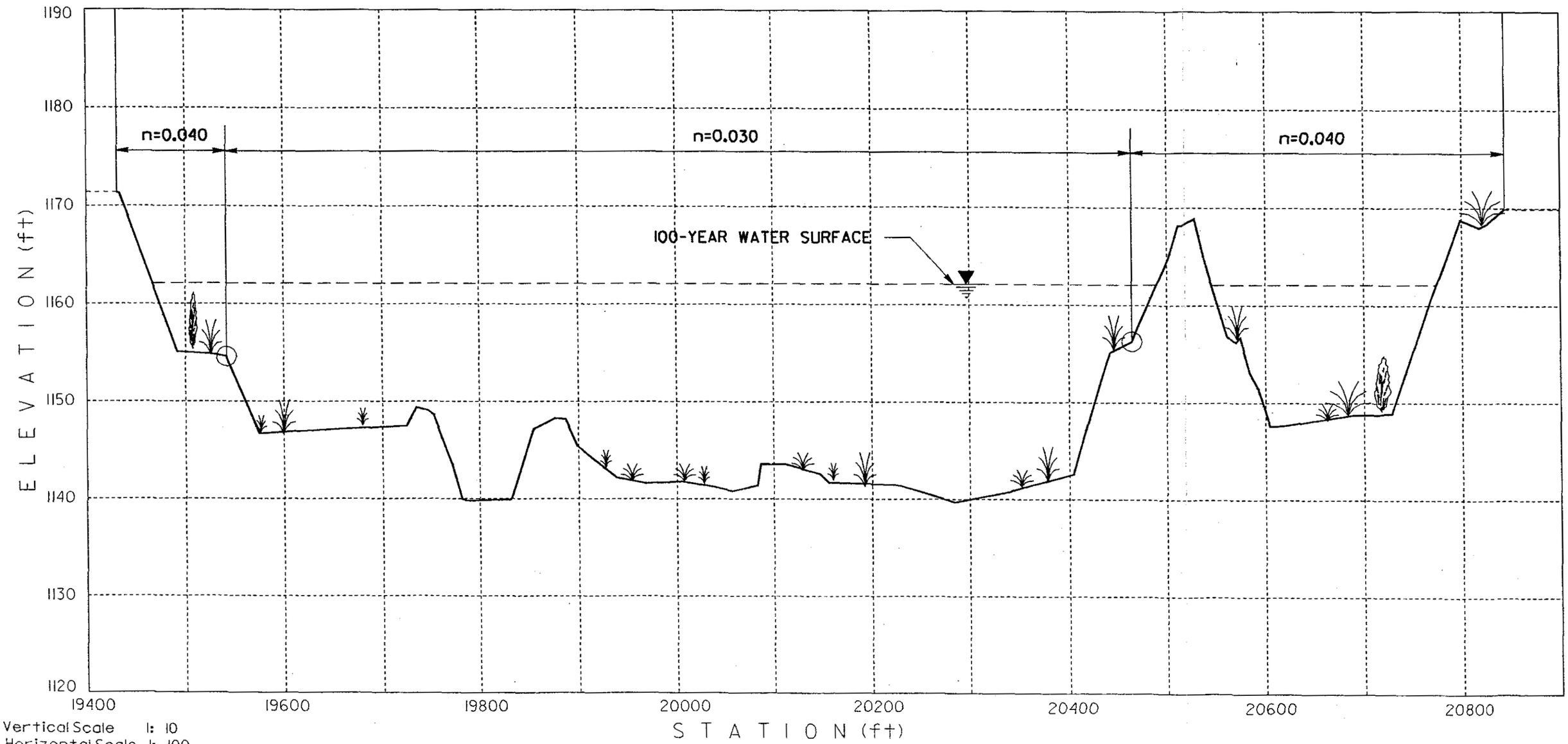
100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	**Components**	**"n" Total**
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.007$ $n_2 = 0.000$ $n_3 = 0.008$	**n = 0.040**
Channel	$n_b = 0.028$ $n_1 = 0.002$ $n_2 = 0.000$ $n_3 = 0.000$	**n = 0.030**

Cross Section 222.10

REACH 4

100–YEAR "n" VALUES



Vertical Scale 1: 10
Horizontal Scale 1: 100

FIGURE 34 – RURAL ROAD BRIDGE

Baker
Michael Baker Jr., Inc.

PHOTO 110 - Section 222.10 - Rural Rd Bridge - Looking W. downstream towards bridge Q = 3500 - 4000 cfs

PHOTO 111 - Section 222.10 - Rural Rd - Looking N. across river, upstream from bridge Q = 3500 - 4000 cfs

PHOTO 112 - Section 222.10 - Rural Rd - Looking N.E. across river at new Indian Bend Wash Bridge Q = 3500 - 4000 cfs

PHOTO 113 - Section 222.10 - Rural Rd - Looking E., upstream towards McClintock Rd Bridge Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 224.90 ±

LOCATION : Approx. Dobson Road alignment

CROSS-SECTION DESCRIPTION : Bed material primarily consists of river rock. Channel shape is irregular. Left and right overbanks are lightly vegetated. The channel is braided within this reach. Channel is primarily clear.

100-YEAR N-VALUE CALCULATIONS

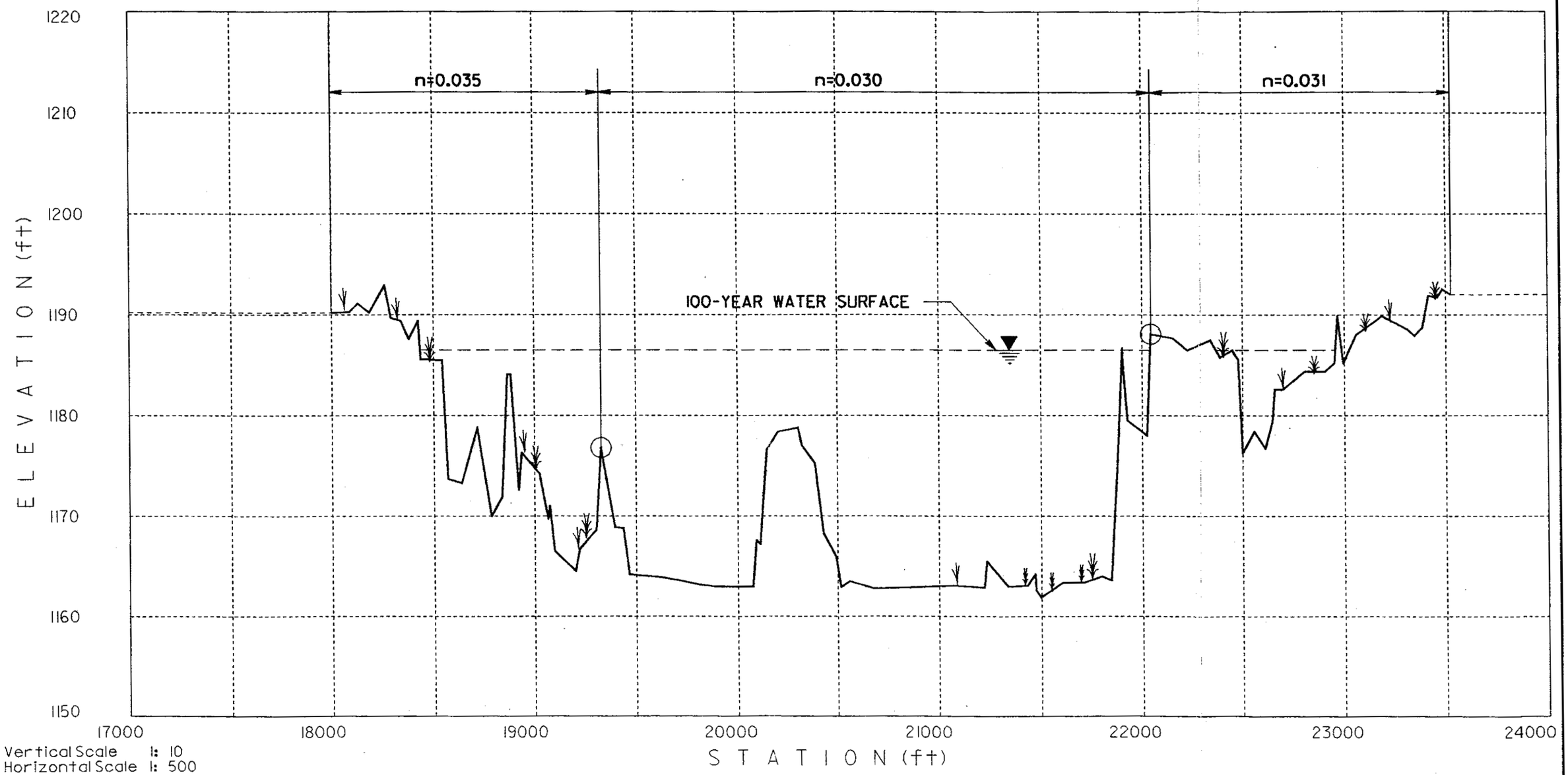
Portion of Cross Section	Components	"n" Total
Left Overbank - Agricultural		**n = 0.025**
Channel	$n_b = 0.028$ $n_1 = 0.002$ $n_2 = 0.000$ $n_3 = 0.000$	**n = 0.030**
Right Overbank	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.003$	**n = 0.031**

Salt–Gila FIS

Cross Section 224.90

REACH 4

100–YEAR "n" VALUES



Vertical Scale 1: 10
Horizontal Scale 1: 500

FIGURE 35 – DOBSON ROAD ALIGNMENT

Baker
Michael Baker Jr., Inc.

PHOTO 114 - Section 224.90 - Dobson Rd Alignment - Looking W. downstream Q = 3500 - 4000 cfs

PHOTO 115 - Section 224.90 - Dobson Rd Alignment - Looking N. across river Q = 3500 - 4000 cfs

PHOTO 116 - Section 224.90 - Dobson Rd Alignment - Looking E. upstream towards Alma School Rd Bridge Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 226.52 ±

LOCATION : Alma School Road Bridge

CROSS-SECTION DESCRIPTION : Bed material consists primarily of river rock. Channel shape is slightly irregular. There is little or no vegetation within channel. Left and right overbanks contain light density vegetation - grass and shrubs.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Clear w/ irreg. - Little to no vegetation w/ inc. irregularity	n_b = 0.025 n_1 = 0.003 n_2 = 0.000 n_3 = 0.001	**n = 0.029**
Clear - Varies with adjustment factors for irregularity and vegetation (See Appendices B & C for Reach 5)	n_b = 0.028 n_1 = 0.000 n_2 = 0.000 n_3 = 0.000	**n = 0.028**
Light - Sparse and/or small vegetation	n_b = 0.025 n_1 = 0.003 n_2 = 0.000 n_3 = 0.004	**n = 0.032**

Cross Section 226.52

REACH 5

100–YEAR "n" VALUES

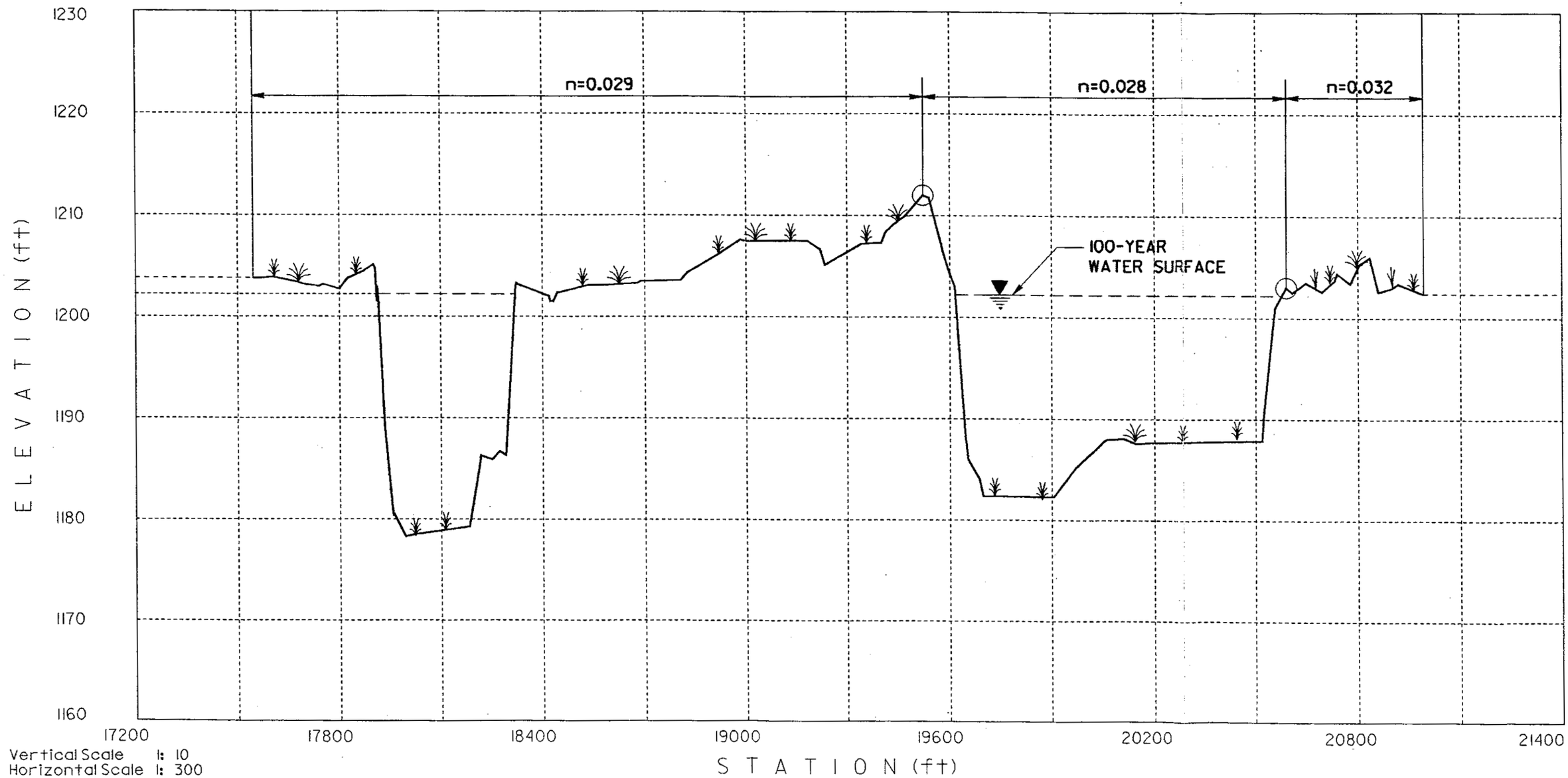


FIGURE 36 – ALMA SCHOOL ROAD BRIDGE

Baker
Michael Baker Jr., Inc.

PHOTO 117 - Section 226.52 - Alma School Rd - Looking W., downstream - Eroded S. bank Q = 3500 - 4000 cfs

PHOTO 118 - Section 226.52 - Alma School Rd - Looking N.E. upstream at right overbank Q = 3500 - 4000 cfs

PHOTO 119 - Section 226.52 - Alma School Rd - Looking E. upstream along channel Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 227.56 - 227.79

LOCATION : Country Club Road Bridge

CROSS-SECTION DESCRIPTION : Bed material consists primarily of river rock. Channel shape is irregular. There is little or no vegetation within channel. Left and right overbanks contain light vegetation. Channel is braided east of Country Club Bridge.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Left and Right Overbanks	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.004$	**n = 0.032**
Channel	$n_b = 0.028$ $n_1 = 0.000$ $n_2 = 0.000$ $n_3 = 0.000$	**n = 0.028**

Salt-Gila FIS

Cross Section 227.79

REACH 5

100-YEAR "n" VALUES

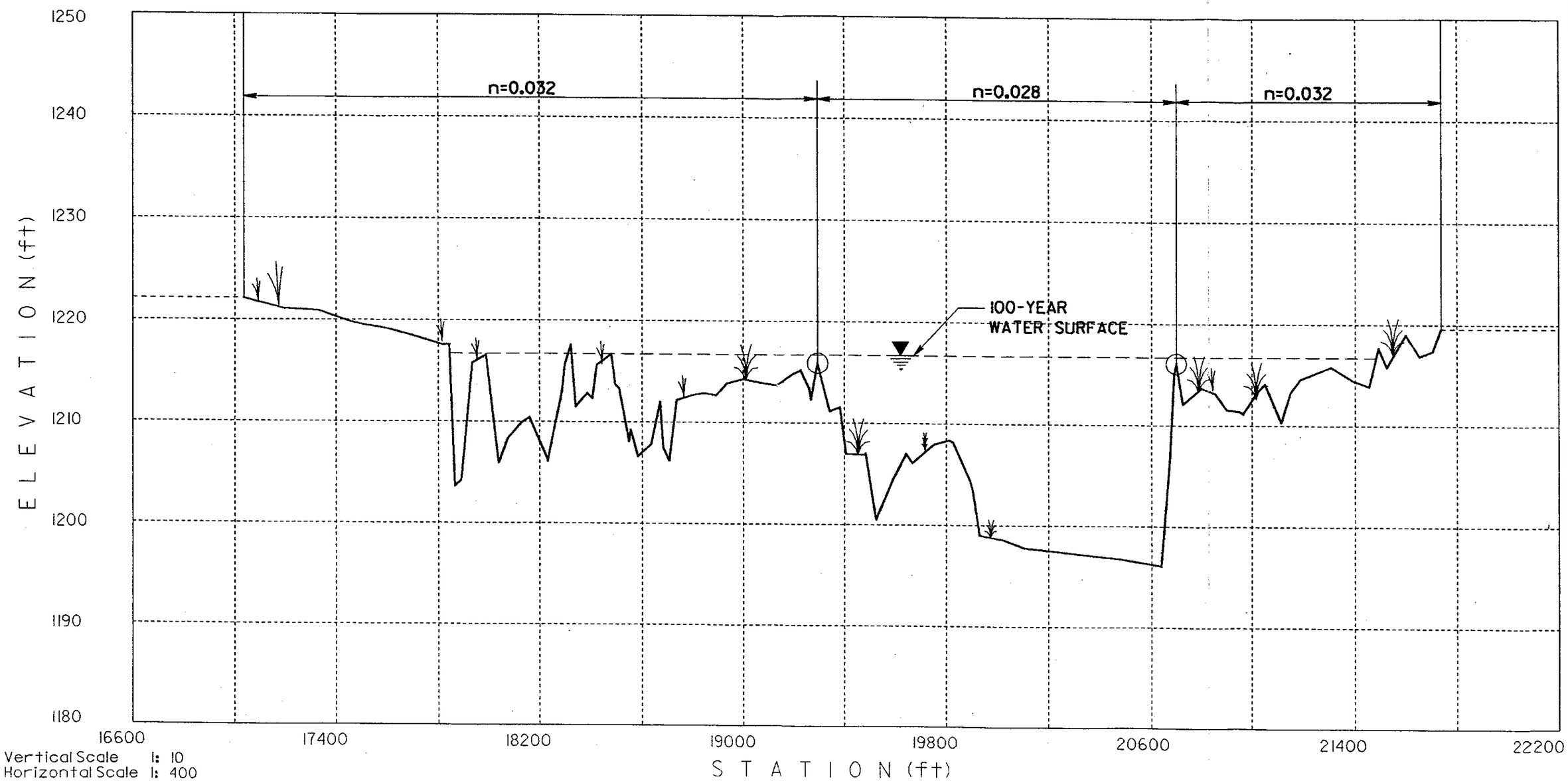


FIGURE 37 – COUNTRY CLUB ROAD BRIDGE

Baker
Michael Baker Jr., Inc.

PHOTO 120 - Section 227.79 - Country Club Rd - Looking W. downstream of bridge Q = 3500 - 4000 cfs

PHOTO 121 - Section 227.79 - Country Club Rd - Looking E. upstream of bridge along channel Q = 3500 - 4000 cfs

PHOTO 122 - Section 227.79 - Country Club Rd - Looking S.E. towards left overbank Q = 3500 - 4000 cfs

CROSS-SECTION(S) : 233.85 ±

LOCATION : Approx. Lehi Road alignment

CROSS-SECTION DESCRIPTION : Bed material primarily consists of river rock. Channel shape is slightly irregular. Vegetation is light-medium in right overbank - grass, shrubs. Left overbank contains medium vegetation - orange groves. Channel is primarily clear of vegetation.

100-YEAR N-VALUE CALCULATIONS

Portion of Cross Section	Components	"n" Total
Channel	$n_b = 0.028$ $n_1 = 0.000$ $n_2 = 0.000$ $n_3 = 0.000$	**n = 0.028**
Right Overbank	$n_b = 0.025$ $n_1 = 0.003$ $n_2 = 0.000$ $n_3 = 0.009$	**n = 0.037**

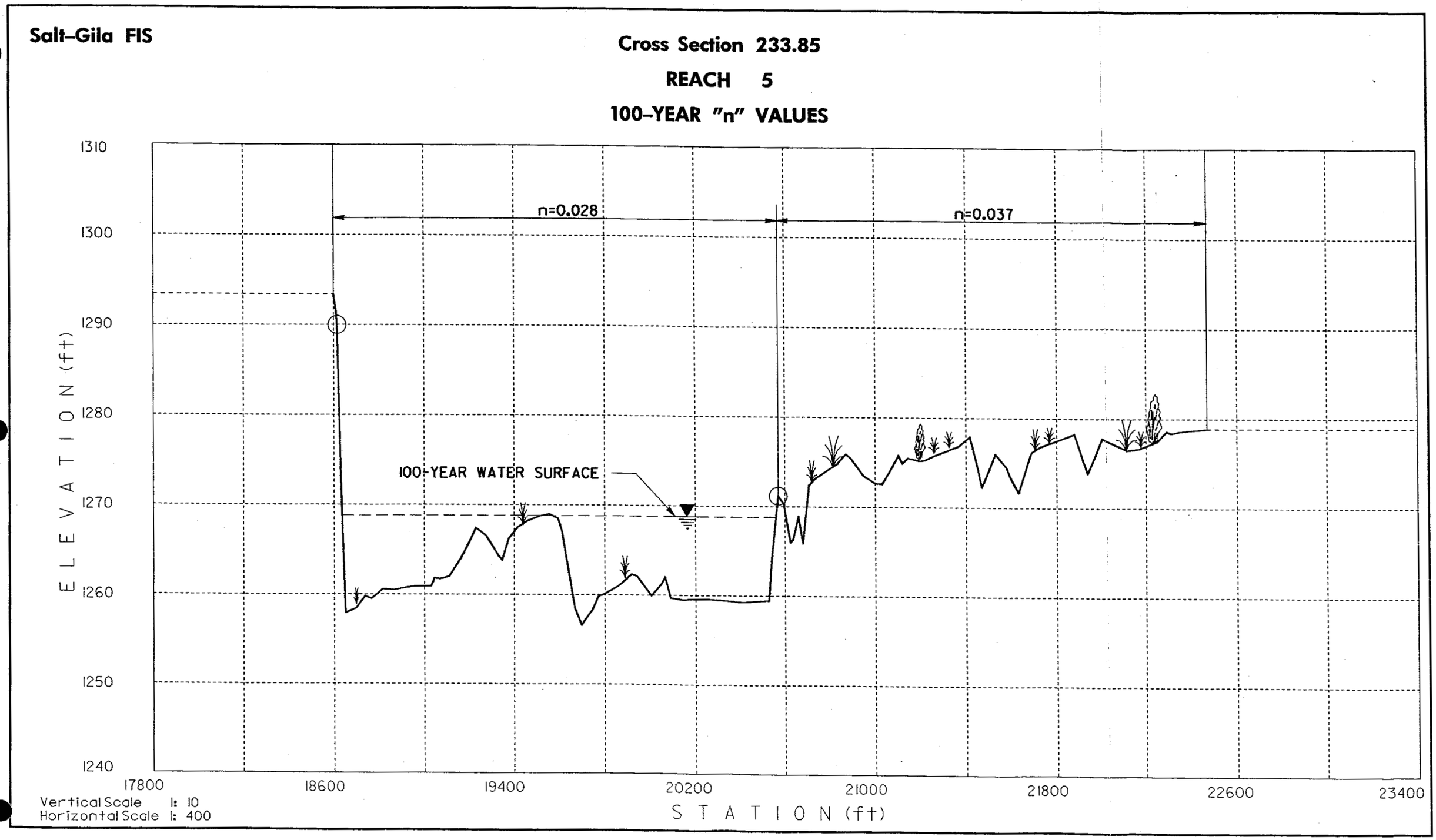


FIGURE 38 – LEHI ROAD ALIGNMENT

Baker
Michael Baker Jr., Inc.

PHOTO 123 - Section 233.85 - Approx. Lehi Rd Alignment - Looking W. downstream along channel Q = 3500 - 4000 cfs

PHOTO 124 - Section 233.85 - Approx. Lehi Rd Alignment - Looking N. across river Q = 3500 - 4000 cfs

PHOTO 125 - Section 233.85 - Approx. Lehi Rd Alignment - Looking E. upstream along channel Q = 3500 - 4000 cfs

VI. SUMMARY

Results from the "n" value analysis were used to define "n" values for the cross sections incorporated in the detailed hydraulic model. The assignment of "n" values for subsections of each individual cross section were accomplished utilizing aerial photographs and the "n" values established in the detailed "n" value analysis. The location of each cross section and the factors that affect the overall "n" value were compared on the aerial photographs with the cross sections developed in the detailed "n" value analyses.

The contraction and expansion coefficients assigned to each cross section were typically 0.1 and 0.3, respectively (2).

The channel reach-lengths were measured along the channel thalweg developed from the digital terrain model. The channel thalweg is defined as the hydraulic baseline for the Salt and Gila River Flood Insurance Study. The overbank reach lengths were measured along the anticipated center of mass path of the overbank flow (2).

APPENDIX A

100-YEAR "n" VALUES
Reach 1 - Reach 5

100 YEAR N - VALUES
SALT/GILA RIVERS FIS - S.O. # 19538
REACH 1

DATE: JUNE 16, 1993
BAKER ENGINEERS BY: DLT CHECKED: RLD

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
166.42	19104.6	0.15	21485.4														
166.49	19262.5	0.15	21301.3														
166.56	18779.8	0.15	21133.1														
166.57	19077.6	0.032	19634.8	0.02	21404.8	0.032	21674										
166.60	19598.4	0.032	19609.3	0.03	20610.8	0.15	21548.1										
166.64	19580.8	0.029	20639	0.15	21658.9												
166.67	19570.8	0.032	19598.9	0.03	20681.3	0.15	21777.3	0.032	21918.3								
166.77	19574.1	0.032	19658.1	0.03	20786.1	0.15	22307.2										
166.86	19479.4	0.029	20937.1	0.15	22231.1												
166.95	19222.4	0.03	20783.7	0.15	22367.8												
167.05	19232.1	0.03	20711.2	0.15	22523.2												
167.13	19200.7	0.032	20521.6	0.15	22603	0.025	23248.8										
167.18	19171.2	0.031	20759.4	0.15	21623	0.025	23809.2										
167.23	19141.8	0.032	19570.9	0.03	20827.2	0.15	22528.1	0.025	24299.2								
167.34	18000.6	0.032	18731.7	0.15	19345.4	0.029	20870.3	0.15	22580.5	0.025	24712.6						
167.43	19383.3	0.029	20598.6	0.15	22555	0.025	25450.8										
167.52	19403.1	0.028	20563.6	0.15	22433.9	0.025	25570										
167.62	19014.2	0.15	19498.5	0.03	20616.4	0.037	21084	0.15	22469.4	0.025	25590.8						
167.71	18542.1	0.15	19473.4	0.03	19571.2	0.029	19938.8	0.037	22004.3	0.025	26136.6						
167.81	17407.3	0.032	18075.6	0.07	18810.2	0.15	19535.3	0.032	19701.8	0.029	20148.6	0.037	22405	0.025	26316.3		
167.90	16798.9	0.037	18773.5	0.15	19544.6	0.032	19773.8	0.031	20382.2	0.037	22701.3	0.025	26990				
167.99	17227.2	0.037	18650.2	0.15	19636.5	0.031	20531.4	0.037	22792.5	0.065	24215.1	0.025	27375				
168.08	16803.3	0.037	18618	0.15	19461.3	0.03	20508.4	0.037	22505.1	0.15	24156.9	0.025	27799				
168.17	16624	0.037	18559.9	0.15	19393.8	0.03	20368.2	0.037	21999.5	0.15	24016.4	0.025	27451	0.032	28089.1		
168.26	16500.1	0.037	19282.4	0.03	20223.6	0.032	21659.5	0.15	24081.2	0.025	27751.6	0.032	28978				
168.34	16697.7	0.032	19483.6	0.03	20322	0.032	21419	0.15	23725.2	0.025	27847.4	0.032	28578				
168.44	17008	0.037	19167.8	0.03	19961	0.032	21261.8	0.15	23766	0.025	28021.8	0.032	28462				
168.53	17719.6	0.037	19111.2	0.03	19659.1	0.032	21108.6	0.15	23831.1	0.025	28404.1	0.043	28948				
168.63	18781.7	0.043	19111.8	0.03	19462.2	0.032	20933.6	0.15	24095.4	0.025	28374.8	0.032	29439				
168.72	18927.7	0.043	19035.1	0.03	19601.1	0.032	20860	0.15	24090	0.025	28509.8	0.032	29461				
168.81	17601.1	0.037	18714	0.15	18821.2	0.029	19986.3	0.032	20921.3	0.15	24058.8	0.025	28470	0.032	29693.4		
168.91	18514	0.037	18895.1	0.15	18952.9	0.03	20691.3	0.032	20914.7	0.15	24159.4	0.025	28595	0.032	30842.3		

Salt/Gila FIS - Reach 1

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
168.99	18903.5	0.15	18987.4	0.03	19845.2	0.029	20777.7	0.032	20980.6	0.15	24505.8	0.025	30119				
169.07	18701.6	0.15	19078.8	0.03	20021.9	0.029	20880.1	0.032	21159.8	0.15	24638.5	0.025	29780	0.065	30387.4		
169.17	17819.5	0.037	18410.9	0.15	19130.1	0.032	19975.8	0.028	20830.9	0.032	21005.9	0.15	24227	0.025	30506.6	0.032	31178.6
169.24	17760.4	0.15	19185.7	0.03	19899.4	0.029	20849.8	0.15	24225.7	0.025	29761.6						
169.31	17201.8	0.15	18957.8	0.03	19947	0.032	20703.7	0.15	23865.1	0.025	31988.8						
169.38	16803.1	0.15	18468.9	0.03	20212.2	0.032	20452.4	0.15	23411.7	0.025	30962						
169.46	17000.9	0.15	18317.1	0.03	19141.4	0.032	20606.2	0.065	23155.7	0.025	31411.8						
169.55	17134.1	0.15	18342.1	0.03	19258	0.032	20811	0.15	20996.8	0.025	25929.8						
169.65	16127.2	0.15	18582.5	0.03	19445.9	0.032	20954.2	0.15	21095.8	0.025	26947.1						
169.74	14852.8	0.065	17154	0.03	18121	0.15	18610.8	0.028	20490.2	0.032	21286.2	0.025	27944				
169.83	14673	0.037	16264.9	0.07	16442.2	0.043	17404.8	0.065	17742	0.032	18536	0.029	20623	0.032	21317.7	0.025	28396.7
169.92	14301.4	0.037	15667	0.07	16143.4	0.037	16430.5	0.15	18312.1	0.03	20631	0.032	21427	0.025	27485.5		
170.02	13727	0.037	15641.7	0.07	16066.6	0.037	16610.8	0.15	18554.1	0.029	20709.4	0.032	21631	0.025	27492.4		
170.09	14012.8	0.025	15852.4	0.07	16198.2	0.037	16689.9	0.15	18517	0.03	20958.8	0.032	21967	0.15	23469.9	0.025	28697.1
170.16	14227.2	0.025	16020.4	0.07	16606.5	0.037	16944.7	0.15	19161.9	0.03	20938.9	0.032	22039	0.15	23786.5	0.025	28993.6
170.25	14038.8	0.025	15912.5	0.07	16137.1	0.037	16368	0.15	18948.3	0.03	20540.7	0.032	21747	0.15	23589.5	0.025	28865.7
170.34	13519.6	0.025	15984.6	0.07	19052.1	0.029	20209.6	0.032	21515.4	0.15	23600.5	0.025	28899				
170.43	13315	0.025	15478.5	0.07	19197.1	0.029	20275	0.032	21539.8	0.15	23685.7	0.025	28990				
170.52	13600.7	0.025	15031.4	0.07	19349.1	0.03	20221.6	0.032	21621.2	0.15	23929.1	0.025	28759				
170.61	13510.4	0.025	15218.9	0.07	19405.4	0.029	20230.8	0.032	21411.6	0.15	24104.9	0.025	28998				
170.70	13767.2	0.025	15381.2	0.07	19473.2	0.029	20408.4	0.032	21501.4	0.065	23660.6	0.025	28933				
170.79	13934.2	0.025	15843	0.07	19483.1	0.029	19914.5	0.032	21518.2	0.065	23391.8	0.025	29100				
170.89	14000.2	0.025	15990.1	0.04	19339.5	0.031	19840.5	0.032	21835.9	0.065	23702	0.025	29197				
171.00	14211.1	0.025	16410.6	0.04	19389.1	0.031	19863.9	0.032	21904.2	0.065	23504.5	0.032	24068	0.025	29453.6		
171.06	14432.7	0.025	16296.1	0.04	19405.9	0.032	21875	0.065	23693.7	0.032	24239	0.025	29548				
171.15	14720.1	0.025	16372.3	0.04	19421	0.031	19802.9	0.032	22012.2	0.065	24386.7	0.025	29996				
171.25	15003.2	0.025	16781	0.04	19445.4	0.029	19795.8	0.032	21181.2	0.065	23166.1	0.025	29462				
171.34	15021.1	0.025	16673	0.04	19210.1	0.027	20522.5	0.032	20839	0.065	23463.8	0.025	29400				
171.43	15361.3	0.025	16912.3	0.04	18995.8	0.03	20826.4	0.065	23946.9	0.025	28982.7						
171.53	15417.9	0.037	18829.4	0.03	20566.1	0.065	25010.2	0.025	28597.7								
171.63	15520	0.025	17152.3	0.04	18855.7	0.027	20391.5	0.065	25480.1	0.025	27999.5						
171.71	15714.8	0.025	16866.1	0.04	18583.3	0.027	20192	0.065	24711.9	0.025	27483.3						
171.80	15848.6	0.025	16688.7	0.04	18549.3	0.027	20181.7	0.043	22208.7	0.065	24043.1	0.025	25978				
171.91	15870.9	0.025	16654.3	0.04	18263	0.029	20142.4	0.043	22346.4	0.025	25187.5						
172.02	15955.2	0.025	16889.5	0.04	18416	0.027	19964.5	0.043	21945.7	0.025	24788						
172.09	16250	0.025	17222.6	0.04	18582.7	0.028	19858.1	0.043	21560.7	0.025	24999.4						
172.16	16403.6	0.025	17389.8	0.04	18534.4	0.03	19714.1	0.043	21185.7	0.025	24897.8						
172.24	16513.8	0.025	17582.3	0.04	18766.5	0.031	19751.7	0.043	21123.3	0.025	24617.1						
172.34	16504.1	0.037	18779.4	0.03	20102.1	0.043	21063.8	0.025	24398.7								
172.43	17072.8	0.037	18916.5	0.03	20382	0.043	20834.4	0.025	24179.7								
172.52	18390.7	0.037	18697.2	0.03	20725	0.043	20918.3	0.025	23913.4								
172.61	18631.4	0.037	19087.3	0.03	20837.7	0.025	23699.6										

Salt/Gila FIS - Reach 1

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
172.71	18709.1	0.043	19187.2	0.03	21003.7	0.025	23669.4										
172.79	18603.8	0.15	19140.1	0.03	21036	0.15	21308.4	0.025	23492.5								
172.84	18523.2	0.15	19186.9	0.03	20821	0.15	21219.8	0.025	23307								
172.89	13536.1	0.15	19130.4	0.03	19753.2	0.032	20896.6	0.15	21145.9	0.025	22898						
172.99	18682.8	0.15	19217.6	0.03	20912.6	0.15	21201.2	0.025	22487.6								
173.08	18729.4	0.15	18797.8	0.03	20900.5	0.15	21051.7	0.025	22270.9								
173.18	18909	0.15	19011.9	0.03	20801.8	0.15	21099.6	0.025	22314.2								
173.27	18986.7	0.065	19091.5	0.03	20300.3	0.15	21295.4	0.025	22416.2								
173.37	18570.9	0.028	20477.5	0.15	21252.2	0.025	22426.4										
173.46	18461.7	0.028	20912.5	0.15	21399	0.025	22749.7										
173.54	18190.5	0.037	18462.1	0.03	21234.3	0.15	21604.7	0.025	23146.4								
173.58	16687	0.037	18546.7	0.03	21378	0.15	21603.4	0.025	23480.9								
173.63	16706.5	0.043	17891.5	0.04	18665.1	0.031	21490	0.15	21788.8	0.025	23798.3						
173.71	16904.4	0.037	18882.9	0.03	21661.1	0.15	21957.1	0.025	24196.9								
173.77	17002.9	0.043	18551.7	0.04	19180.7	0.029	21897.6	0.15	22204.3	0.025	24488.6						
173.84	17510.7	0.043	19275.6	0.04	19597.5	0.03	23145.6	0.025	24789.4								
173.91	17700.4	0.065	19822.4	0.03	23425.4	0.025	26966.4										
173.99	18202.1	0.065	19695	0.04	20065.8	0.03	23698.4	0.025	25104.3								
174.08	18300	0.065	19885.1	0.04	20189	0.03	23851.7	0.025	27390								
174.17	18425.8	0.065	19867	0.04	20290.2	0.03	23732.9	0.025	26520								
174.28	18513	0.065	19895.8	0.04	20302	0.03	23829.2	0.025	25384.1								
174.38	18308	0.065	19666.8	0.04	20241.7	0.03	23705.1	0.025	25988.7								
174.43	18307.9	0.065	19713.7	0.04	20203.1	0.029	23651.1	0.025	25144.1								
174.47	18000.2	0.065	19707.2	0.04	20242.9	0.03	23544.9	0.025	25469.7								
174.56	17408.6	0.032	18514.8	0.07	19535.4	0.037	20272.5	0.03	22848.8	0.065	24627.4	0.025	25999				
174.65	17456.2	0.032	18173.8	0.07	19599.6	0.037	20577.6	0.03	22388	0.065	24871.6	0.025	25880				
174.73	17419.5	0.032	18061.3	0.07	19503.7	0.037	20102.9	0.031	22246	0.065	25006.7	0.025	25935				
174.81	17250.2	0.032	17839.3	0.07	19636.7	0.032	20650.8	0.033	20235	0.065	24608.2						
174.89	17206.7	0.032	17837.7	0.07	19406.6	0.032	20720	0.033	21893.8	0.065	24898.4						
174.96	17002.1	0.032	18080	0.07	19340.5	0.032	20364.2	0.031	21503	0.065	25418.6						
175.05	16334.5	0.032	17887.9	0.07	19125.3	0.03	20240.4	0.032	21241.6	0.065	24695.2						
175.15	16028.5	0.032	17679.6	0.07	19066.8	0.03	19960.4	0.032	21028	0.065	25336.2	0.025	26174				
175.25	16209.7	0.032	17705.6	0.07	19038.8	0.029	19884.3	0.032	20846.3	0.065	25118.1	0.025	26346				
175.34	16206	0.032	17682.9	0.07	19038.2	0.028	19917.2	0.032	20845.4	0.15	24906.9	0.025	26160				
175.44	16354.6	0.032	17524.3	0.07	18981.6	0.028	19798.3	0.032	20763.7	0.15	24880.8	0.025	25767				
175.53	16200.7	0.032	16993.1	0.07	18155.7	0.037	18924.3	0.03	19729.1	0.032	20622.8	0.15	25062	0.025	25899		
175.62	16842.3	0.032	16948.5	0.07	18089.1	0.037	18858.7	0.03	19648.5	0.032	20706.2	0.15	24921	0.025	25947.4		
175.72	17407.2	0.065	17999.1	0.04	19072.9	0.03	19770.9	0.032	20706.9	0.15	23810.4	0.025	25995				
175.81	17405.6	0.065	18079.2	0.04	18997.3	0.03	20614	0.15	23905.1	0.025	26402.8						
175.91	17260.7	0.065	18221.5	0.04	19185.3	0.03	20576	0.15	23862.3	0.025	26773.6						
176.00	17032.2	0.065	18285.4	0.04	19339.8	0.03	20561.1	0.065	23711.6	0.025	26167.6						
176.10	16919.8	0.037	19130.3	0.03	20548.5	0.15	23572.6	0.025	26963.9								

Salt/Gila FIS - Reach 1

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
176.19	17028.2	0.037	19399.7	0.03	20549.1	0.15	23530.1	0.025	25906.5								
176.28	17166.9	0.037	19182.1	0.03	20564.8	0.15	23452.5	0.025	25495.2								
176.37	17819.3	0.032	18622	0.04	19202.6	0.03	20545.2	0.15	23617.1	0.025	25158.1						
176.47	17802.4	0.037	18696.3	0.04	19147.5	0.03	20557.9	0.15	24016.7	0.025	25481.6						
176.56	17737.2	0.037	18670.5	0.04	19115.7	0.032	19599.1	0.028	20578.2	0.15	24179.6	0.025	25914				
176.65	17800.8	0.037	18745.4	0.04	19198.8	0.032	19701.7	0.03	20605.8	0.15	24233	0.025	24743				
176.75	17532.8	0.032	18936.2	0.04	19366.7	0.032	19579	0.027	20475.7	0.032	21472.4	0.15	24183	0.025	24947		
176.80	17212.6	0.032	19080.2	0.04	19471.9	0.032	19660.7	0.028	20401.5	0.032	21789.6	0.15	24162	0.025	25269.7		
176.84	17420.1	0.032	19206.8	0.04	19540.7	0.032	19673.2	0.028	20626.6	0.032	22043	0.15	24083	0.025	25289.2		
176.89	18608.3	0.025	19686.3	0.03	19794.3	0.028	20609	0.032	22252.4	0.15	23899.9	0.025	25371				
176.93	19155.4	0.043	19696.9	0.03	20612.5	0.043	22295.2	0.15	23883.3	0.025	24986.8						
177.03	19280.7	0.043	19701.8	0.03	20607	0.043	22142.5	0.15	23673	0.025	25770.3						
177.12	19075	0.043	19725.8	0.03	20588.5	0.065	22190.4	0.15	23027.6	0.025	24461.2						
177.22	16523.5	0.043	19574.1	0.03	20569.2	0.043	20931.2	0.15	22826.4	0.032	24749.4						
177.31	16311.8	0.025	18963.2	0.04	19710.2	0.028	20534	0.043	21140.9	0.15	23091.4	0.025	25384				
177.40	15805.3	0.025	18376.4	0.07	19623.1	0.028	20519	0.15	22880.7	0.025	25985.6						
177.48	16035.7	0.025	18680.6	0.04	19531.9	0.028	20525.4	0.15	22592.4	0.025	25276.6						
177.58	15301.1	0.025	18076.9	0.07	19567.7	0.027	20506.8	0.15	22642.2	0.025	25964.7						
177.66	15820.3	0.025	18252.7	0.07	19365	0.028	20528.4	0.15	23015.4	0.025	25884.6						
177.75	16215.1	0.025	17990.8	0.15	19312.2	0.028	20496	0.15	22692.4	0.025	25595.2						
177.80	16014.3	0.025	17983.5	0.15	19310.2	0.028	20484	0.15	22709.3	0.025	25961.5						
177.84	16002.3	0.065	19310.7	0.03	20481.2	0.15	22854.4	0.025	26797.6								
177.92	15569.1	0.065	19335	0.03	20459	0.15	22773.2	0.025	25954.1								
178.00	16008.7	0.065	19555.2	0.03	20519	0.037	20681.2	0.15	22815.3	0.025	26675.7						
178.08	15546.8	0.065	19631.8	0.03	20582.4	0.15	23208	0.025	26863.5								
178.17	15032.2	0.032	16880.8	0.07	19466.3	0.028	20624.9	0.065	23283.8	0.025	27435.8						
178.26	14737.6	0.032	16953.6	0.07	19443	0.028	20686.8	0.065	22859	0.025	27390.8						
178.33	14693.8	0.032	17979.3	0.07	19483.2	0.028	20735.6	0.065	23157.3	0.025	27299						
178.40	14620	0.032	17830.9	0.07	19279.4	0.028	20779.9	0.065	23177.6	0.025	26972						
178.50	14649.2	0.032	17816.6	0.07	19240.2	0.027	21008.5	0.065	23252.9	0.025	26992.7						
178.55	14696.1	0.032	17840.5	0.07	19335.5	0.028	20980.1	0.065	23218.8	0.025	26998.3						
178.61	14528.7	0.025	16475.1	0.03	17889.4	0.065	19336.9	0.027	21103.7	0.065	23164.8	0.025	26995				
178.68	14468.8	0.025	16416.9	0.03	17870.9	0.065	19469	0.028	21260	0.065	23391	0.025	26889				
178.77	14564.3	0.025	16370.1	0.03	17852.4	0.065	19720.1	0.027	21488	0.065	24243.8	0.025	26797				
178.86	14602.5	0.025	16423.1	0.03	17866.1	0.065	19563.3	0.026	20776	0.065	24146.2	0.025	27465				
178.95	14685.4	0.025	16204.5	0.03	18170	0.065	19739.8	0.028	21014.2	0.032	22094.6	0.15	24182	0.025	26599.1		
179.03	14605.7	0.025	16187.4	0.03	17765.9	0.065	19708.8	0.028	21039.4	0.032	22074.2	0.15	24180	0.025	26983.8		
179.11	14600.4	0.025	16119.7	0.03	17584.8	0.065	19664.8	0.028	21022.4	0.032	22233	0.15	24261	0.025	27735.4		
179.20	14710.2	0.025	16019.3	0.03	17491.4	0.065	19437.1	0.028	21065.6	0.032	22001.2	0.15	24355	0.025	27670.3		
179.25	14621.1	0.032	17520.6	0.07	19388.2	0.028	20960.8	0.065	21199.8	0.03	21633.8	0.15	24335	0.025	27791.3		
179.30	14539.8	0.065	19409.5	0.03	20958.5	0.065	21157.3	0.027	21719	0.065	26272.4	0.025	27771				
179.35	14411	0.065	19420.8	0.03	20908.8	0.065	21042.4	0.028	21758.4	0.065	26253.3	0.025	27961				

Salt/Gila FIS - Reach 1

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
179.40	14523.1	0.065	19410.7	0.03	20846.4	0.043	21012.8	0.028	21607.8	0.065	26168.9	0.025	27987				
179.50	14198.2	0.032	17836.9	0.04	19470.1	0.028	20767.1	0.032	20916.9	0.028	21574.6	0.065	26066	0.025	28230.8		
179.59	14631.8	0.032	17993	0.04	19570.5	0.028	21296.9	0.065	25962.8	0.025	28251.9						
179.68	14702.3	0.032	17419.3	0.04	19608.2	0.029	20965.1	0.065	25840.3	0.025	28667.6						
179.76	15008.2	0.032	17238.9	0.04	19293.1	0.028	20636.6	0.065	25916.6	0.025	28192.2						
179.84	15015.1	0.032	16768.5	0.04	18983.3	0.03	20557.4	0.065	26556.6	0.025	28997.8						
179.91	14718.4	0.043	19217.5	0.03	20514.4	0.065	26316.1	0.025	27972.4								
180.01	14509.7	0.043	19376.7	0.03	20702.1	0.065	27999.5										
180.03	14179	0.037	19335.5	0.03	20932.9	0.065	25049.6	0.025	28178.2								
180.06	15155.3	0.037	19544.3	0.03	20943.4	0.065	25154.1	0.025	27984.1								
180.09	15120.6	0.037	19537.6	0.03	20905.7	0.065	25145.3	0.025	28432.8								
180.18	14868.5	0.037	19471.8	0.03	20990.8	0.065	25189.8	0.025	27981.9								
180.28	14858.7	0.037	19411.6	0.03	20821.8	0.065	25223.6	0.025	28165.2								
180.37	14708.2	0.037	19327.4	0.03	20796.2	0.065	21252.7	0.15	25290.7	0.025	27995.7						
180.47	14801.7	0.032	19323.5	0.03	20731.7	0.065	21227.3	0.032	21368.3	0.15	25444.7	0.025	28867				
180.56	14713.1	0.032	19368.3	0.03	20727	0.065	21157.2	0.032	21404.1	0.15	24126.3	0.043	25474	0.025	28265.3		
180.65	15062.7	0.032	19346.7	0.03	20622.2	0.065	20850.3	0.032	21142.6	0.15	24320.1	0.043	25438	0.025	28413.5		
180.75	15321.8	0.032	19445.1	0.03	20601.7	0.065	20893.5	0.032	21194.4	0.15	24524.1	0.043	25470	0.025	28779.3		
180.85	15715.8	0.032	19461.1	0.03	20727.3	0.043	20957.2	0.032	21386.1	0.15	24577.8	0.043	25503	0.025	28890.2		
180.94	15919.6	0.032	19429.9	0.03	20831.7	0.032	21188.9	0.15	25377.7	0.025	28495.2						
180.99	16004.8	0.032	19521.9	0.03	20911	0.15	25301.7	0.025	28856.9								
181.04	15505.5	0.032	19404.1	0.03	20956.9	0.15	25230.1	0.025	28649.5								
181.13	15825.2	0.032	19284.4	0.03	21217.7	0.15	25186.8	0.025	28882.9								
181.23	15632.1	0.032	19310	0.03	21260.5	0.15	25045.6	0.025	28938.2								
181.32	15808.1	0.037	19263.8	0.03	21469.7	0.15	24826.5	0.025	28896.4								
181.41	16069.4	0.037	19229.4	0.03	21450.6	0.15	24637.1	0.025	28378.1								
180.51	16541.8	0.037	19312.4	0.03	21433	0.15	24625	0.025	27999.1								
181.62	16983	0.037	19549.8	0.03	21368.6	0.15	24488.1	0.025	28443.8								
181.74	17284.5	0.037	19541.9	0.03	21215.5	0.15	24292.1	0.025	28680.5								
181.82	17708.4	0.037	19448	0.03	20983.5	0.15	24104.5	0.025	28291.2								
181.90	17817.2	0.037	19400.3	0.03	20802.5	0.15	24111.2	0.025	28472.7								
181.99	18503.3	0.037	19360.2	0.03	20502.4	0.037	21239.2	0.15	23996.3	0.025	28480.2						
182.08	18533.4	0.037	19436.5	0.03	20402.2	0.037	21179.9	0.065	23638.3	0.025	28443.4						
182.17	18580.5	0.037	19388.5	0.03	20327.6	0.032	21794.1	0.065	22839.4	0.043	26089.7	0.025	28882				
182.27	19284.4	0.029	20484.8	0.04	26165.8	0.025	28679										
182.36	19206.8	0.029	20452.9	0.04	22838.7	0.065	25947.1	0.025	27773.3	0.037	28669.8						
182.45	19224.1	0.03	20307.7	0.07	22163.8	0.043	25671.5	0.025	28950.6								

100 YEAR N - VALUES
SALT/GILA RIVERS FIS - S.O.# 19538
REACH 2

DATE: AUGUST 3, 1993
BAKER ENGINEERS BY: KJT CHECKED: RLD

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
182.55	18613.2	0.032	18812.6	0.03	20443.4	0.15	22244.1	0.043	23944.8	0.065	28493.9	0.025	28934.5				
182.64	18435.4	0.03	20005.6	0.15	23105.1	0.043	24215.5	0.065	28360.1	0.025	29187.5						
182.74	18343.3	0.03	20459.7	0.15	22132.3	0.043	22935.6	0.065	28435.3	0.025	29947						
182.83	18410.4	0.03	20525.9	0.15	21988	0.043	22370.2	0.065	28490.3	0.025	28788.5						
182.92	18429.9	0.03	20531.8	0.15	22013	0.043	23005.5	0.065	28217.9	0.025	29599.6						
183.02	18402.5	0.028	20533.7	0.15	21719.7	0.043	22918.2	0.065	28508.2	0.025	29792.1						
183.11	18463	0.032	18783	0.028	20583.4	0.15	22435.1	0.043	22986.4	0.065	28444.5	0.025	29787.2				
183.20	18453.2	0.028	20559.3	0.15	21860.4	0.043	22432	0.065	25601	0.025	29599.1						
183.30	18650.1	0.026	20491.2	0.15	21559.9	0.043	22532.5	0.065	25418.8	0.025	29458.5						
183.39	19042.7	0.026	20475.2	0.15	21300.9	0.043	22246.5	0.065	26801.8	0.025	29989						
183.49	19103.6	0.026	20474.2	0.15	21425.8	0.043	22751.2	0.15	23298.7	0.065	26464.5	0.025	29985.3				
183.58	18803.8	0.032	19184.3	0.026	20476.1	0.15	21271.9	0.043	22659.7	0.15	23046.5	0.065	26331.5	0.025	30376.1		
183.67	19177.2	0.026	20496.6	0.15	21421	0.043	22701.1	0.15	23383.6	0.065	26180.5	0.025	29923				
183.77	18950.7	0.043	19363.9	0.026	20510.7	0.15	21492.4	0.043	22588.4	0.15	22875.3	0.065	26069	0.025	30151.4		
183.86	18950.1	0.043	19341.6	0.026	20510.3	0.15	21442.1	0.043	22939	0.025	25905.8	0.043	27283.6	0.032	28591.4	0.025	30357
183.96	18803.4	0.043	19223	0.026	20522.5	0.15	21270.9	0.043	23022.8	0.025	25738.2	0.043	27007.5	0.032	28244.6	0.025	29976
184.05	18408.6	0.043	19343.8	0.026	20556.6	0.15	21005	0.043	22428.5	0.15	23051.4	0.025	26236.4	0.043	26978.8	0.032	29973.3
184.14	18514.6	0.043	19361.1	0.026	20587.1	0.043	21902.4	0.15	22996.1	0.025	30396.4						
184.24	18844.8	0.032	19272.7	0.026	20645.2	0.043	21732.3	0.15	23080.9	0.025	30375.1						
184.33	19243.8	0.026	20742.2	0.065	21627.9	0.15	23318.4	0.025	29998.6								
184.43	19020.1	0.028	20806.3	0.15	23232.4	0.025	30494.6										
184.53	18333.6	0.043	18940.2	0.028	20933.5	0.15	23336	0.025	30396.8								
184.62	17810.5	0.043	19088.7	0.028	20665.2	0.15	22775.1	0.025	30282.6								
184.71	17701.8	0.065	19208.8	0.028	20640.9	0.15	22004.7	0.025	30985.4								
184.81	17481.3	0.065	19115.6	0.028	20348.3	0.15	21916.1	0.025	22810.2	0.037	23491.2	0.025	31842.1				
184.90	17265.8	0.065	19293.1	0.028	20722	0.15	23564.7	0.025	30984								
185.00	17508.6	0.065	19394	0.028	20837.7	0.15	22430.8	0.025	30493.1								
185.10	17525.4	0.065	19417.6	0.026	20877.5	0.15	23454.3	0.025	30696.8								
185.19	17152.9	0.065	19323.5	0.026	21051.6	0.15	23131.3	0.025	30696.8								
185.28	17072.3	0.065	19406.5	0.026	21034.3	0.15	23024.1	0.025	30364.3								
185.38	17362.8	0.065	18145.4	0.043	19167.9	0.026	21198.3	0.15	23137.6	0.025	30867.9						
185.46	17150.8	0.065	18131.7	0.043	19077.8	0.026	20947.9	0.15	23145.5	0.025	30794.8						
185.53	17158.1	0.065	18779.8	0.029	20976.8	0.15	23180.1	0.025	30869.4								
185.61	17081.2	0.065	18602	0.029	21082.6	0.15	23059.3	0.025	30868.8								
185.71	17061	0.065	18892.8	0.029	20810.8	0.15	22968.6	0.025	31408.8								
185.81	17237.1	0.065	18373.8	0.029	21385.9	0.15	22919.8	0.025	31244.8								
185.90	17044.9	0.065	18034.7	0.029	21277.1	0.15	22863.3	0.025	31464.6								
186.00	17007.6	0.065	18924.3	0.029	21108.1	0.15	22869	0.025	30827.1								
186.10	16805.3	0.065	19438.7	0.028	20901.2	0.15	23420.6	0.025	31414.2								

Salt/Gila FIS - Reach 2

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
186.19	16703.7	0.065	19091.4	0.028	20814.7	0.15	23290	0.025	31331.5								
186.27	17016.7	0.15	19145.5	0.028	20733.9	0.15	23273.7	0.025	31146.3								
186.36	16815.1	0.15	19209.2	0.028	20846.9	0.15	23222.2	0.025	31628.5								
186.46	15785.1	0.15	19059.5	0.028	20609.3	0.15	23177.2	0.025	31063.6								
186.55	18001.2	0.15	19271.4	0.028	20567.5	0.15	23130.8	0.025	31174.2								
186.61	17706.6	0.15	19285.9	0.028	20541.7	0.15	23346.4	0.025	31110.5								
186.69	18198.8	0.15	19175.5	0.028	20398.1	0.15	23207.2	0.025	31600.9								
186.78	18267.8	0.15	18797.9	0.043	19001.7	0.028	20350.6	0.15	23155.1	0.025	31832.4						
186.87	18052.9	0.065	18852.8	0.028	20400	0.15	21605.4	0.025	31916.2								
186.97	17703.7	0.065	18711.5	0.028	20397.9	0.15	21504.1	0.025	32015.1								
187.06	18210.8	0.065	18814.5	0.028	20266.6	0.065	21319.2	0.025	32114.9								
187.15	18115.2	0.065	18686.6	0.03	20612	0.065	21744.9	0.025	32128.2								
187.24	18406.8	0.065	18963	0.03	20647.7	0.065	21874.2	0.025	31822								
187.36	17063.3	0.065	18951.6	0.03	20909.5	0.025	32784.7										
187.45	17315.3	0.065	18778.8	0.03	21040	0.025	32898.9										
187.54	16484.8	0.065	18902.8	0.03	20942.2	0.025	32735.3										
187.64	17435	0.065	19149.8	0.03	20811.5	0.032	21594.2	0.025	32822.9								
187.73	17304.3	0.065	19064.3	0.03	20707.9	0.032	21732.4	0.025	32804.6								
187.82	17839.6	0.065	19134.4	0.03	20575.2	0.032	21975.7	0.025	32821.1								
187.91	18003.2	0.065	19105.1	0.03	20615.2	0.032	21671.2	0.025	32822.9								
188.00	17809.5	0.065	19009.2	0.03	20360.5	0.032	21647.5	0.025	32782.3								
188.05	17507.4	0.065	19086.5	0.03	20458.5	0.032	20893.4	0.025	32737.4								
188.06	17503.1	0.065	19439.4	0.03	20236.5	0.043	20890.7	0.025	32651.4								
188.10	18347.4	0.065	19528.9	0.03	20340	0.043	21504.3	0.025	32615.6								
188.20	18202.1	0.043	18481.2	0.15	19579.2	0.03	20352	0.065	21652.9	0.025	32446.6						
188.29	18244	0.15	19223.3	0.026	20155	0.065	21871.2	0.025	32101.1								
188.39	18183	0.15	19276.5	0.026	20749.3	0.065	21938.7	0.025	32296.7								
188.50	17952.5	0.065	19381.5	0.028	20433.7	0.065	21907.8	0.025	32020.9								
188.59	17700.9	0.065	19372.6	0.028	20602.2	0.065	21947.5	0.025	31909.9								
188.70	17683.7	0.15	18385.6	0.043	19273.4	0.028	20594	0.065	22056.3	0.025	32453.8						
188.81	17608.2	0.15	18194.5	0.032	19379.1	0.028	20682.6	0.065	22223	0.025	32592.7						
188.92	17681.9	0.15	18159.2	0.032	19399.6	0.027	20610.1	0.065	22632.6	0.025	32415.7						
189.02	17401.1	0.15	18416.1	0.032	19523.7	0.027	20519.7	0.065	23766	0.025	32418.3						
189.12	18160.7	0.15	18540.8	0.032	19514.5	0.027	20477	0.065	23536.3	0.025	32423.7						
189.22	18203.8	0.15	18629.5	0.032	19483.3	0.027	20494.6	0.065	23493.1	0.025	32291.7						
189.31	18205.1	0.15	18671.1	0.032	19569.8	0.027	20639.4	0.065	23253.5	0.025	32341						
189.39	18305.7	0.032	19137.4	0.027	20645.3	0.065	23323.7	0.025	32299.8								
189.49	18254.6	0.15	18892.2	0.032	19315.8	0.027	20755.5	0.065	23339.2	0.025	31950.9						
189.58	18052.1	0.15	18917.4	0.032	19361.1	0.027	20744.1	0.065	23187.5	0.025	31794.7						
189.68	17815.9	0.15	18789.3	0.032	19236.6	0.027	20880.2	0.065	22976.8	0.025	31459.1						
189.77	18103.7	0.15	19398.7	0.027	20792.2	0.065	23055.2	0.025	32213.3								
189.87	18306.3	0.15	19452.1	0.026	20687.1	0.043	22874	0.025	31736.8								
189.96	18200.2	0.15	19454.7	0.026	20647.6	0.043	22548.5	0.025	31381.3								
190.05	18021.5	0.15	19365.6	0.026	20578.7	0.043	22535.9	0.025	31126								
190.15	16806.6	0.15	19414.4	0.026	20569.7	0.15	21612.8	0.065	22802.6	0.025	30808.9						
190.24	17851.9	0.15	19463.7	0.026	20562.4	0.15	21729.1	0.065	22893.7	0.025	30660.7						
190.34	18103.2	0.15	19621.6	0.026	20560.1	0.15	21308	0.043	22050.1	0.15	23281.7	0.025	30468.5				

Salt/Gila FIS - Reach 2

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
190.43	18066.2	0.15	19632.2	0.026	20574.9	0.15	21216.1	0.043	22532.5	0.15	23454.9	0.025	30231.1				
190.53	18233.1	0.043	18748.7	0.025	19343.5	0.065	19773	0.026	20588.7	0.15	21464.1	0.043	22608.6	0.15	23559.1	0.025	30012.1
190.62	17913.4	0.025	19199.8	0.065	19623.5	0.026	20590.4	0.15	21389.1	0.043	22478.2	0.065	23918.3	0.025	29299.6		
190.71	16760.6	0.025	19049.9	0.065	19623.4	0.026	20589.5	0.15	21249.7	0.043	22686.6	0.065	23981	0.025	29459.6		
190.80	16505.6	0.025	18983.9	0.065	19602.3	0.026	20665.9	0.15	21132.3	0.043	22385.4	0.065	23935	0.025	28922		
190.89	16503.2	0.025	18931.1	0.065	19585.6	0.026	20762.2	0.15	21085.2	0.043	22849.7	0.065	23829.7	0.025	29056.5		
190.99	16293.2	0.032	16993	0.025	18778	0.065	19442.8	0.026	20787.1	0.15	21063	0.043	23952	0.025	24989.6		
191.08	16419.8	0.032	16979.6	0.025	18535.6	0.065	19565.5	0.026	20671.3	0.043	24118.1	0.025	28306.2				
191.17	16315.6	0.032	16853.7	0.025	18419.9	0.065	19609.1	0.026	20499.6	0.043	24139.3	0.025	28053.3				
191.27	16501.2	0.025	18500.8	0.065	19632	0.026	20414	0.043	24413.3	0.025	27936.7						
191.36	16334	0.032	17034.6	0.025	18312.3	0.065	19680.7	0.026	20461.9	0.043	24590.4	0.025	27982				
191.46	15929	0.032	16578.3	0.025	18687.7	0.065	19499.6	0.026	20384.2	0.043	23859.3	0.025	28068.5				
191.55	16003.3	0.032	16554.8	0.025	18357.1	0.065	19405.4	0.026	20321.8	0.043	23529.8	0.025	28050.1				
191.65	16063.7	0.032	16532.3	0.025	18412.7	0.065	19121.3	0.026	20490.3	0.043	23213	0.025	27493.1				
191.75	16397.4	0.032	16567.2	0.025	18451	0.065	19529.2	0.026	20687.8	0.043	22812	0.025	28257.3				
191.84	16434.8	0.032	17403.4	0.025	18504	0.065	19456.9	0.026	20502.1	0.043	22631	0.025	27978.9				
191.94	16743.4	0.032	17267.1	0.025	18559.9	0.065	19437.3	0.026	20510.1	0.043	22292.6	0.025	27105.3				
182.04	16825.8	0.032	17203.6	0.025	18607.1	0.065	19259.3	0.026	20283.3	0.043	21385	0.025	27087				
192.13	16803.1	0.032	17533	0.025	18681.9	0.065	19651.1	0.026	20275.6	0.043	21816	0.025	27072.2				
192.23	16854.1	0.032	17064.2	0.025	18791.4	0.065	19447.3	0.026	20692	0.043	21572	0.025	27278.5				
192.33	17338.2	0.032	17338.2	0.025	18978.5	0.065	19477.7	0.026	20901.8	0.043	22561.5	0.025	27111				
192.42	17244.5	0.032	17244.5	0.025	19044.8	0.065	19838.9	0.026	20863.5	0.043	22180	0.025	26801				
192.51	17519.2	0.032	17613.2	0.025	19234.6	0.065	19500.3	0.026	20793.5	0.043	21917	0.025	26783.2				
192.60	17485.7	0.032	17756.1	0.025	19312.8	0.029	20373.5	0.043	21536.3	0.025	26448.7						
192.69	17820	0.032	17950.3	0.025	19322.8	0.029	21029.5	0.043	21792.1	0.025	26290.7						
192.78	17836.7	0.032	18182.7	0.025	19307.3	0.029	20890.8	0.043	22150.3	0.025	26344						
192.88	17937.3	0.032	18220.6	0.025	19219.4	0.029	20578.2	0.043	22500.6	0.025	26258						
192.97	18073.4	0.025	18966.4	0.029	20494.2	0.043	22539.5	0.025	26204								
193.07	17608	0.025	18646.8	0.032	19800.7	0.029	20683.7	0.043	23274	0.025	26110						
193.16	17457.1	0.025	18633.3	0.032	19030	0.029	20513.9	0.043	23165	0.025	26241						
193.24	17704.2	0.025	18700.6	0.032	19278.5	0.029	20591.5	0.043	23109.8	0.025	26068.5						
193.36	17978.2	0.025	18798.7	0.032	19064.1	0.029	21113.4	0.043	22937.9	0.025	25914						
193.45	18539.7	0.025	18958	0.031	20472.3	0.043	23071.9	0.025	25965.7								
193.54	19062.5	0.031	21160.9	0.043	23225	0.025	25694										
193.65	18919.7	0.031	20662.2	0.043	23123.6	0.025	25714.8										
193.71	18741.9	0.031	20451	0.043	23046.1	0.025	25921.5										
193.78	18041.9	0.025	18602.8	0.031	20565.3	0.043	22965.5	0.025	25536								
193.86	17460.6	0.025	18621.7	0.031	20100.5	0.032	21546.2	0.043	22862.8	0.025	25671.2						
193.93	17144.2	0.025	18724.5	0.031	20661.6	0.032	21590.6	0.043	22905.4	0.025	25708.9						
194.01	16680.8	0.025	18832.5	0.031	20374.8	0.032	21276	0.043	22866	0.025	25710.3						
194.09	16494.1	0.025	18919.9	0.031	19808.5	0.032	21490.6	0.043	22639.1	0.025	25699.8						
194.19	16763.3	0.025	19090.2	0.031	21310.6	0.043	25898.2										
194.20	16805.2	0.025	19090.3	0.031	21308.4	0.043	25809.2										
194.29	16727	0.025	18949.5	0.031	21319.5	0.043	22469.2	0.025	25693.6								
194.40	16334.9	0.025	19006.6	0.031	21567.9	0.043	25690.2										
194.53	15853.1	0.025	18928.9	0.031	21540.4	0.043	22484.4	0.025	25797.1								
194.62	16215	0.025	18871.4	0.031	21570.9	0.043	22411.5	0.025	25856.2								

Salt/Gila FIS - Reach 2

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
194.72	16804.8	0.032	18793.5	0.031	21735	0.043	23202.4	0.025	25900.9								
194.81	16922.9	0.032	18830.9	0.031	20930.1	0.032	22290.5	0.025	25804.5								
194.91	16952.1	0.032	18830	0.031	21286.9	0.032	22147	0.025	25967.9								
195.00	16932.1	0.032	18846.6	0.031	20978	0.032	22022.1	0.025	26042.5								
195.09	17259.5	0.032	19017.6	0.031	20850.3	0.043	21722.4	0.025	26189.7								
195.14	17261.9	0.032	19012.5	0.031	20857.3	0.043	21820	0.025	26246.7								
195.15	17254.9	0.032	19013.5	0.031	20865.3	0.043	21793	0.025	26255.1								
195.19	17251.5	0.032	18826.1	0.031	20880.2	0.043	21744.6	0.025	26447.3								
195.28	17044.9	0.032	18876.8	0.031	21105.9	0.043	21689.7	0.025	26489.3								
195.38	17018.7	0.032	18956.3	0.031	20862.2	0.043	21637.1	0.025	26685.9								
195.47	17792.4	0.032	19030.1	0.031	20885.5	0.043	21534.1	0.025	26977.2								
195.56	18535.8	0.032	19137.7	0.031	21181	0.043	21779.4	0.025	26736.9								
195.66	19143.1	0.031	21280.8	0.043	21993.7	0.025	27225.1										
195.75	19463.8	0.031	21116.4	0.043	22204.8	0.025	27093.2										
195.85	19590.5	0.031	20914.5	0.065	22211.1	0.025	27923.1										
195.94	19522.4	0.031	20819.6	0.065	22498	0.025	28917.8										
196.04	18716	0.043	19691.2	0.028	20457.4	0.043	22718	0.025	28782								
196.13	17603.2	0.043	19668.7	0.028	20516.2	0.15	21169.8	0.032	28560.9								
196.23	17383.2	0.043	19600	0.028	20517.3	0.15	21540.8	0.032	28468.4								
196.32	17304.6	0.043	19695.4	0.028	20577.6	0.15	21431.6	0.032	27394.8								
196.42	17283.5	0.043	19686.9	0.028	20635.6	0.15	21393.8	0.032	27859								
196.51	17314.6	0.043	19835.8	0.028	20733.2	0.15	21907.2	0.025	28148.8								
196.61	17396.9	0.043	19538	0.03	20862.7	0.15	21975	0.025	27674.4								
196.70	17573.9	0.15	18760.8	0.032	19236.9	0.15	19929.7	0.03	20968	0.15	22031	0.025	28793.9				
196.79	17706	0.15	19092	0.032	20849.1	0.15	22147	0.025	28460								
196.88	17999.6	0.043	19080.4	0.032	20746.6	0.15	22404.1	0.025	28009.9								
196.98	18215.3	0.032	21026.5	0.15	22507.1	0.025	28001.9										
197.07	18156.8	0.032	21168.4	0.15	22608.4	0.025	28024										
197.16	18108.5	0.032	21623.9	0.15	23015.6	0.025	28062										
197.26	17801	0.043	19952.4	0.032	21072.6	0.15	23373.7	0.025	29325								
197.35	18240.6	0.043	19314.9	0.15	19953.8	0.032	20648.7	0.065	22704.1	0.025	29383						
197.45	18283.9	0.043	20026.7	0.032	20905.2	0.065	23088.4	0.025	29321.3								
197.54	18353.9	0.043	20038.2	0.032	20665.8	0.065	23239.8	0.025	29422								
197.64	18412	0.043	19855	0.032	20599.1	0.065	23216.2	0.025	29465.4								
197.74	18369.7	0.043	19916.3	0.032	20849.6	0.065	23058.1	0.025	29557.6								
197.83	18231.8	0.043	19436	0.032	21078.2	0.065	22943.5	0.025	29613.1								
197.92	18191.2	0.043	19072.2	0.032	21145.6	0.065	23004.6	0.025	24386.7	0.042	25722	0.025	29631.2				
198.02	18153.5	0.043	19096.9	0.032	21106.9	0.065	22451.1	0.025	22684	0.025	24397.1	0.042	25753.7	0.025	29659.1		
198.11	17902	0.043	20092.9	0.03	20906.4	0.15	23161	0.025	24384	0.042	25769.8	0.025	28370				
198.20	18101	0.043	19792.9	0.03	21091.1	0.15	22023.3	0.025	24411	0.042	25738.4	0.025	29519.9				
198.26	17999.7	0.043	19895.6	0.03	21257.8	0.15	22010.9	0.053	24392	0.025	30995						
198.30	18002.3	0.043	20014.2	0.03	21002.8	0.15	21935	0.053	24355	0.025	30779.1						
198.34	17998.4	0.043	19290.1	0.03	21397.1	0.15	21880.9	0.053	24353	0.025	30955.4						
198.40	18085.7	0.043	19425.7	0.03	21394.6	0.15	21828.2	0.053	24395	0.025	30949						
198.49	17909.9	0.043	19969.8	0.028	21390.5	0.025	21856.9	0.053	24426	0.025	30938						
198.59	18198.7	0.032	20227.3	0.028	21268	0.15	21977.7	0.025	28324								
198.66	18083.1	0.032	20224.4	0.028	21108.6	0.15	22026.8	0.025	28320.5								

Salt/Gila FIS - Reach 2

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
198.75	18349.9	0.032	21034.4	0.15	21929.8	0.025	30818.5										
198.85	18288.9	0.032	20792.3	0.15	21787.9	0.025	30650.8										
198.94	18242.3	0.032	20634.5	0.15	21680	0.025	30455.1										
199.04	18530.8	0.032	20278.9	0.15	21474.4	0.025	30263.6										
199.15	18662.3	0.032	20274.5	0.15	21366.6	0.025	30111.6										
199.24	18858.1	0.032	20498.8	0.15	21472.3	0.025	30078.3										
199.30	18878	0.032	20114.6	0.065	21769.7	0.025	29970.2										
199.34	18927	0.15	19382.1	0.032	20292.9	0.065	21604.6	0.043	26194	0.025	29977.4						
199.44	18309.1	0.15	19162.1	0.032	20369.7	0.065	21758.6	0.043	26166	0.025	30294.8						
199.53	17089.9	0.15	19176.5	0.032	20027.7	0.065	21840.7	0.025	30210.3								
199.63	15721	0.15	20496.6	0.032	20960.6	0.065	21791	0.025	30238.9								
199.72	14925.6	0.15	19275.2	0.032	20640.7	0.065	21644.9	0.025	26281.8								
199.82	14626.5	0.15	19165.1	0.065	21405.4	0.025	26277										

100 YEAR N - VALUES
SALT/GILA RIVERS FIS - S.O. # 19538
REACH 3

DATE: AUGUST 30, 1993
BAKER ENGINEERS BY: KJT CHECKED: RLD

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
199.91	14357	0.15	16318.5	0.043	17747.3	0.15	19433.2	0.032	21013.4	0.043	21377.5	0.025	25559.1				
200.00	13751.9	0.15	15628	0.043	17008.1	0.15	19566.9	0.032	21329.4	0.043	21713.7	0.025	25622.7				
200.10	13401.5	0.15	15425.2	0.043	16821.1	0.15	19524.2	0.032	20642.8	0.043	21165.6	0.025	25963				
200.20	13153.3	0.15	18233.7	0.065	19482.3	0.032	20235.8	0.043	21215	0.025	25498.7						
200.30	13125.5	0.15	18261.2	0.065	19395.7	0.032	20263.9	0.043	21206.4	0.025	24983.7						
200.39	13083.9	0.15	16875.2	0.043	18751.2	0.15	19506.7	0.032	20199	0.043	21040.9	0.025	24952.5				
200.49	13048.9	0.15	15548.1	0.043	18273.7	0.15	19342.5	0.032	20192.3	0.043	21170.7	0.025	24956.8				
200.58	13004.2	0.15	14609	0.043	17947	0.15	19481.5	0.032	20105.5	0.043	21425.2	0.025	24969.5				
200.67	12952.7	0.043	17919.3	0.15	18962.8	0.032	19040.9	0.15	19366.3	0.032	20263.4	0.043	21603.5	0.025	24996.7		
200.77	12925.1	0.043	17828.8	0.15	19321.8	0.032	19857.8	0.037	21785.8	0.025	24978.1						
200.86	12893	0.043	17934.1	0.15	19619.6	0.032	20308.4	0.037	21898	0.025	25174.5						
200.95	12874.8	0.043	17824.4	0.15	18729.3	0.037	19517.6	0.032	20323.1	0.037	21953.6	0.025	24988.3				
201.05	12848.3	0.043	16687.2	0.15	17177.7	0.025	17947.8	0.15	18965.7	0.037	19485.9	0.032	20402.5	0.037	21849.3	0.025	24997.1
201.14	12823.9	0.043	16303.6	0.065	17184.4	0.025	18032	0.15	18850.4	0.037	19609.5	0.032	20553.6	0.037	21720.7	0.025	25365.2
201.24	12806	0.043	16132.2	0.065	17180.2	0.025	17947.6	0.15	18956.9	0.037	19659.5	0.032	20174.4	0.037	21569.8	0.025	25490
201.33	12785.7	0.043	15854.4	0.065	17266.3	0.025	17929.5	0.15	19116.8	0.032	19315	0.043	21381.8	0.025	23443.9		
201.43	12790.4	0.043	15827.9	0.065	17202.1	0.025	17853.5	0.15	19253.6	0.032	20649.1	0.043	21342.1	0.025	23387.4		
201.52	12786.6	0.025	17009.5	0.15	17261.7	0.025	17845.2	0.15	19480.7	0.032	20243.6	0.043	21391.4	0.025	23370.2		
201.62	12723.6	0.025	16799.9	0.15	17197.5	0.025	17792.9	0.065	19577.3	0.032	20509.2	0.037	21351.3	0.025	23318.4		
201.71	12659.2	0.025	17706.7	0.065	19660.9	0.032	20554.9	0.037	21354.6	0.025	23245.5						
201.81	12574.1	0.025	17700.9	0.065	19378.9	0.032	20392.1	0.037	21975.7	0.025	23169.5						
201.90	12498	0.025	17569	0.043	19389.1	0.032	20331.6	0.037	21982.2	0.025	23095.8						
201.99	12423.7	0.025	17507.7	0.043	19357.8	0.032	20250.9	0.037	22006.5	0.025	23024.3						
202.09	17015.4	0.025	17491.8	0.043	19086	0.037	21985.1										
202.18	17052.9	0.025	17415.4	0.043	18976	0.037	21992.4										
202.29	17300	0.025	17469.5	0.043	18989.6	0.037	21563.4	0.043	22785.4								
202.37	17046.5	0.025	17390.7	0.043	18743.6	0.037	21693.1										
202.48	17009.6	0.043	19074.6	0.037	21590.9												
202.59	17002.6	0.025	18022.2	0.043	19217.7	0.037	21478.1										
202.69	17011.6	0.025	17868	0.043	19084.1	0.037	21274.4										
202.80	16524.8	0.025	17771.4	0.043	19243.7	0.037	21093.4										
202.90	16149.3	0.025	17815	0.043	18872.7	0.037	21080.4										
202.99	17058.5	0.025	17646.3	0.043	19058	0.037	20975.9										
203.09	16077.3	0.025	17588.1	0.043	18814.5	0.037	20917.3	0.025	21170.7								

Salt-Gila FIS - Reach 3

	NH						STATIONS										
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
203.19	16639.2	0.025	17762.5	0.043	18734.5	0.037	21012.9	0.025	21380.1								
203.29	14306.7	0.025	16968.8	0.037	18535.2	0.032	21295.1										
203.39	15500	0.025	16832.2	0.037	18601.7	0.032	21223.3										
203.48	15578.8	0.025	17369.6	0.037	18619.2	0.032	20886.7	0.025	20999.1								
203.58	15526.8	0.025	17202.6	0.037	18681	0.032	20782.3	0.025	23783.2								
203.67	15401.1	0.025	16957.3	0.037	18941.9	0.032	20795.9	0.025	23620.8								
203.77	15516.5	0.025	17495.9	0.043	18803.6	0.032	20854.5										
203.86	17504.9	0.043	18891.2	0.032	21488.8												
203.96	16511.6	0.025	17175.8	0.043	18902.5	0.032	20803.5	0.037	21694.3								
204.05	18304.1	0.037	18552.5	0.032	21090.6	0.025	22860.7										
204.15	16507.2	0.025	18824.1	0.032	21379.2	0.025	22708.9										
204.25	17812.5	0.025	18724.9	0.032	21219.5	0.025	22500.4										
204.34	18066.2	0.025	18774.5	0.037	20878.6	0.025	22317.8										
204.42	17576	0.025	18839.1	0.037	20701.7	0.025	20966.9										
204.53	17504.9	0.025	18647	0.037	20566	0.025	22011.3										
204.61	14501.4	0.025	18498.9	0.037	20482.9	0.025	21963.1										
204.68	17501.1	0.025	18472.2	0.037	20582.8	0.025	20970.6										
204.78	16026.1	0.025	18427.5	0.037	20840.4	0.025	20982.7										
204.87	17067.4	0.025	18221.3	0.037	20961.2	0.025	21197.6										
204.97	16000	0.025	18301.9	0.037	20961.3	0.025	21496										
205.06	19026.5	0.037	20905.3	0.025	21997.9												
205.15	18001.2	0.025	18146.4	0.037	20746.3	0.025	21293										
205.25	16580.4	0.025	18108.7	0.037	20782.3	0.025	21499.5										
205.34	18517.6	0.043	20931.1	0.025	21995.5												
205.40	17511.1	0.043	19079.8	0.032	22455.6												
205.43	17577.6	0.043	18981	0.032	21088.9	0.025	22285.4										
205.52	17458.9	0.043	18628.8	0.032	21032.1	0.025	22399.5										
205.62	16987.1	0.025	17481.8	0.043	18471.7	0.032	20846.6	0.025	22288.5								
205.75	17305.3	0.043	21131.3	0.025	22145												
205.84	17154.7	0.043	18575.4	0.032	20875	0.037	21695.8										
205.94	16903.8	0.043	19004.1	0.032	20938.8	0.037	21683.4										
206.03	16802.9	0.043	19400.5	0.032	21184.2												
206.13	16722.1	0.043	19547.3	0.032	20989.1												
206.22	16557.5	0.043	19583	0.032	20990.9	0.025	21480										
206.32	16817.7	0.043	18404.3	0.032	20988.9	0.025	21368.3										
206.41	16072.3	0.025	17185.4	0.043	18300.2	0.032	20729.4										
206.51	15913.8	0.025	17218.7	0.043	18235.8	0.032	21020.8										
206.60	15752.8	0.025	16944.2	0.043	18334.4	0.032	21998.5										
206.70	16235.4	0.025	16640.8	0.043	18329.6	0.032	21487.8										
206.79	16211.1	0.025	16525.2	0.043	18378.4	0.032	20986.5										
206.88	16205.8	0.025	16696.6	0.043	18386.3	0.032	21604.9	0.025	21674.6								
206.97	16303.3	0.025	16719.6	0.043	18407.6	0.032	21498.3										

Salt-Gila FIS - Reach 3

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
207.07	16445.4	0.043	18490.8	0.032	21999.5												
207.16	16210.1	0.025	17204.5	0.043	18605.9	0.032	21998.1										
207.27	16209.3	0.025	17640.8	0.043	19008.8	0.032	21462.6										
207.34	16035.2	0.025	17693.3	0.043	19196.9	0.032	20996.7										
207.43	16001	0.025	17611.5	0.043	19012	0.032	21984.8										
207.48	19021.7	0.032	21790.2														
207.49	19041.1	0.032	21996.7														
207.53	16022.7	0.025	17620.2	0.043	19124.1	0.032	21797.5										
207.62	16251.6	0.025	17591.1	0.043	19005.5	0.032	21785.6										
207.71	16626.2	0.025	17556.4	0.043	18981.8	0.032	22156.6										
207.80	16720.8	0.025	17520.5	0.043	19039.6	0.032	22180.2										
207.90	18318.7	0.043	19047.9	0.032	22488.9												
207.99	17809.3	0.043	19108.5	0.032	22476.6												
208.10	16819.7	0.025	17741	0.043	18805.9	0.032	22460.5										
208.19	16738.4	0.025	17715.2	0.043	18707.5	0.032	22485.7										
208.29	17002.6	0.025	17725.5	0.043	18645.9	0.032	20909.3	0.037	21987.4	0.025	22197.1						
208.39	18033.7	0.043	18597.1	0.032	20718.2	0.037	22382.1										
208.48	18038.2	0.043	18585	0.032	20545.1	0.037	22376.9	0.025	22430.2								
208.57	17892.9	0.037	19101.4	0.032	21032.4	0.037	22585.2										
208.67	17786.1	0.037	19116.6	0.032	20826	0.037	22428.2	0.025	23789.9								
208.75	17694.2	0.037	19192.9	0.032	20799.2	0.037	22314.1	0.025	22490.7								
208.85	17667	0.037	19199.7	0.032	20701.9	0.037	22086										
208.95	17388.1	0.037	19276.9	0.032	20123.6	0.037	22186										
209.04	17502.1	0.037	19410.3	0.032	20461.4	0.037	22253.9	0.025	22467.8								
209.14	18530.6	0.037	19338.9	0.032	20418.3	0.037	21999.2	0.025	22293.3								
209.24	18800.9	0.037	19228	0.032	20312	0.037	21913.2	0.025	22690.1								
209.33	18805.6	0.037	19263.6	0.032	20535	0.037	21018.4	0.025	22913.4								
209.42	18513.1	0.037	19197.6	0.032	20581.2	0.037	20872.3	0.025	22992.9								
209.53	18816.5	0.037	20071.9	0.032	20504.1	0.037	20940.8	0.025	22979.5								
209.54	18715.7	0.037	20063	0.032	20496.7	0.037	21212	0.025	23191.6								
209.60	18471.1	0.037	19341.4	0.032	20578	0.037	21376.6	0.025	24277.2								
209.69	18487.6	0.037	19451.6	0.032	20578.5	0.037	21290	0.025	22887.2								
209.79	19302.1	0.037	19469.8	0.032	20496.1	0.037	21349	0.025	22896								
209.88	18501.6	0.037	19513	0.032	20472.5	0.037	21351	0.025	22895.7								
209.98	19210.8	0.032	19303.8	0.037	20623.9	0.025	22872.1										
210.07	18501.7	0.032	18978.8	0.037	20945.5	0.025	22885.1										
210.17	18525.7	0.037	19354.6	0.032	20991.7	0.037	21359.2	0.025	22897.3								
210.26	18518	0.037	19372.2	0.032	20694.8	0.037	21393.2	0.025	22891.2								
210.36	19224.5	0.032	19357.1	0.037	20776.7	0.025	22797.5										
210.46	18491.3	0.037	19176.5	0.032	20150.4	0.037	21454	0.025	22652.2								
210.55	19008	0.037	19303.5	0.032	20483.2	0.037	22585										
210.64	19062.1	0.037	19388.6	0.032	20460.6	0.037	22591.1										

Salt-Gila FIS - Reach 3

	NH STATIONS																
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7	n7	STA8	n8	STA9
210.74	19417.4	0.037	19417.4	0.032	20433.7	0.037	22399.8										
210.83	19202.3	0.037	19438.4	0.032	20410.4	0.037	22499.7										
210.93	19200.1	0.037	19464.2	0.032	20414.8	0.037	22397.4										
211.02	19239	0.037	19472.3	0.032	20394.3	0.037	22399.8										
211.12	19314	0.037	19483.7	0.032	20572.2	0.037	22293.4										
211.21	19418.7	0.037	19507.4	0.032	20571.8	0.037	22171										
211.31	19209.8	0.037	19510.1	0.032	20434.4	0.037	21786										
211.41	18498.4	0.037	19649.4	0.032	20256.4	0.037	20552.2										
211.51	18453.9	0.037	19581.4	0.032	20485.3	0.037	22766										
211.54	18434.7	0.037	19494.6	0.032	20559.6	0.037	23770.6										
211.64	18329.6	0.037	19581	0.032	20141.7	0.037	22829.3										
211.71	18245.4	0.037	19514.7	0.032	20171.6	0.037	23312.9										
211.79	18077.3	0.037	19113.1	0.032	20257.6	0.037	23205.6										
211.89	17674	0.037	19774.6	0.032	20291.8	0.037	22944.4										
211.99	17333.6	0.037	19700.9	0.032	20254.8	0.037	22499.4										
212.08	17051.2	0.037	19688.2	0.032	20418.2	0.037	21694.4										
212.18	16831.3	0.037	19647	0.032	20390.5	0.037	21950.5										
212.27	18008.4	0.037	19676.4	0.032	20350.9	0.037	21995.1										
212.37	18816.9	0.037	19684.6	0.032	20396.5	0.037	22407.8										
212.46	18753.5	0.037	19684.4	0.032	20415.6	0.037	22917.1										
212.56	18526.6	0.037	19692.8	0.032	20425.6	0.037	21952.1										
212.66	18418.4	0.037	19663.3	0.032	20436.9	0.037	21368.9										
212.69	17061.3	0.037	19598.9	0.032	20433.2	0.037	22337.3										
212.74	15451.4	0.037	19678.6	0.032	20387.5	0.037	21421.2										
212.84	16284.9	0.037	19695.5	0.032	20367.7	0.037	22398.2										
212.93	18913.7	0.037	19673.1	0.032	20498.7	0.037	23394										
213.03	16056.5	0.037	19666.3	0.032	20645.8	0.037	21481.2										
213.11	17566.5	0.037	19606.1	0.032	20599.1	0.037	22488.2										
213.21	18330.9	0.037	19490.3	0.032	20500.9	0.037	21278.4										
213.24	18666.4	0.037	19408.2	0.032	20401.8	0.037	21030.6										
213.27	18714.1	0.037	19488.9	0.032	20396.9	0.037	21066										
213.33	17662.6	0.037	19328.9	0.032	20508	0.037	21244.4										
213.38	17634.6	0.037	19346.1	0.032	20473	0.037	20996.7										
213.47	17897	0.037	19243.3	0.032	20274.2	0.037	20783.9										
213.57	17508.1	0.037	19484.5	0.032	20373.8	0.037	21311.2										
213.66	17026.7	0.037	19675.2	0.032	20297.7	0.037	20999.4										
213.73	17355	0.037	19627.9	0.032	20360.7	0.037	20562.2										
213.76	17506.6	0.04	19578.8	0.035	20348.1	0.04	21617.1										
213.85	17827.8	0.04	19423.4	0.035	20328.7	0.04	21970.5										
213.95	19012.2	0.04	19583.1	0.035	20337.1	0.04	22391.3										
214.04	19072.9	0.04	19636.8	0.035	20376.6	0.04	22747.1										
214.14	18555.4	0.04	19651.9	0.035	20388.3	0.04	22710.3										

100 YEAR N - VALUES
SALT/GILA RIVERS FIS - S.O. # 19538
REACH 4

DATE: JULY 30, 1993
BAKER ENGINEERS BY: DLT CHECKED: RLD

	NH				STATIONS		
SEC	STA1	n1	STA2	n2	STA3	n3	STA4
214.23	18784.1	0.04	19608.5	0.035	20361.7	0.04	22345.5
214.33	19133.3	0.04	19483.8	0.035	20398	0.04	22776.7
214.42	18493.5	0.04	19379.9	0.035	20431.8	0.04	22834
214.52	18661.1	0.04	19449.9	0.035	20402	0.04	22823.5
214.61	19556.5	0.04	19651.7	0.035	20490.2	0.04	23027
214.71	16537.2	0.04	19613	0.035	20556	0.04	23206.9
214.77	16998	0.04	19340.2	0.035	20490.4	0.04	23169.1
214.79	17109.4	0.04	19468.3	0.035	20617.9	0.04	23296.1
214.90	17273.7	0.04	19537.4	0.035	20466.5	0.04	23466.2
214.99	17407.8	0.04	19576.5	0.035	20339.8	0.04	23652.7
215.09	17408.5	0.04	19661.5	0.035	20300.4	0.04	23776.7
215.18	17264.2	0.04	19632.1	0.035	20332.7	0.04	23708.6
215.27	17090.5	0.04	19610.6	0.035	20553.9	0.04	23765.1
215.36	17106.4	0.04	19618	0.035	20537	0.04	23715.5
215.46	17157.6	0.04	19591	0.035	20521.1	0.04	23621.3
215.56	17244.5	0.04	19576.8	0.035	20510	0.04	23646
215.65	17237.9	0.04	19571.5	0.035	20501.7	0.04	23634.8
215.75	17125.3	0.04	19508.1	0.035	20522.5	0.04	23577.6
215.80	17167.1	0.04	19534.7	0.035	20420.7	0.04	23575.2
215.82	17758.7	0.04	19545.6	0.035	20432.6	0.04	23562.1
215.84	17657.2	0.04	19556.3	0.035	20461.6	0.04	23377.2
215.94	17234.9	0.04	19526.4	0.035	20496.8	0.04	23179.1
216.04	17056.9	0.04	19386.1	0.035	20473.4	0.04	22941.8
216.13	16426.6	0.04	19318.1	0.035	20445.7	0.04	22597.4
216.23	16307.2	0.04	19329.5	0.035	20429.8	0.04	22197.5
216.96	16758.3	0.04	19365.5	0.035	20453.9	0.04	21751.1
216.42	15777.7	0.04	19535.3	0.035	20517.4	0.04	21332.3
216.48	19055	0.04	19487.2	0.035	20601.5	0.04	20845.9
216.53	19072.9	0.04	19466.1	0.035	20582.6	0.04	20857.1
216.62	17507.5	0.035	19548.8	0.035	20490.4	0.035	22583.5
216.72	16943.1	0.035	19564	0.035	20580.5	0.035	22919.8
216.81	16958.9	0.035	19573.2	0.035	20517.7	0.035	21219.6
216.91	16966.5	0.035	19578.8	0.035	20707	0.035	21024.6
217.00	17095.3	0.035	19586.7	0.035	20599.2	0.035	20664.3
217.10	17268.6	0.035	19579.6	0.035	20548.9	0.035	20802.1

Salt-Gila FIS - Reach 4

SEC	NH STATIONS						
	STA1	n1	STA2	n2	STA3	n3	STA4
217.19	17427.8	0.035	19535.9	0.035	20537.9	0.035	20568.3
217.29	17565.7	0.035	19485	0.035	20564.5	0.035	20846.2
217.38	17690	0.035	19440.2	0.035	20532	0.035	21152.1
217.48	17808.8	0.035	19388.5	0.035	20532.5	0.035	23743.4
217.57	17982	0.035	19471.2	0.035	20633.2	0.035	24356.3
217.66	17904.5	0.035	19478.1	0.035	20622.6	0.035	23422.1
217.76	17772.6	0.035	19498.1	0.035	20462	0.035	23327.5
217.86	17693.2	0.035	19481.5	0.035	20684.4	0.035	23246.6
217.95	17751.2	0.035	19400.2	0.035	20501.2	0.035	23141.7
218.04	17383.5	0.035	19372.8	0.035	20453.8	0.035	23051.5
218.14	17245.9	0.05	19375.8	0.035	20449.9	0.05	23000
218.24	17318.9	0.05	19283.6	0.035	20548.1	0.05	22878.3
218.33	17150.7	0.05	19375.5	0.035	20571.3	0.05	22840.7
218.42	16769.9	0.05	19375.9	0.035	20548.4	0.05	22886
218.52	18225.3	0.05	19323.9	0.035	20554.3	0.05	24099.6
218.61	18755.9	0.05	19480.3	0.035	20554.9	0.05	24674.5
218.71	18879.5	0.05	19444.5	0.035	20527.4	0.05	23971.7
218.80	18682.3	0.05	19476.7	0.035	20533	0.05	23310.3
219.00	18918.9	0.05	19378.8	0.035	20583.9	0.05	23056.2
219.04	19391.3	0.035	20608.9	0.05	22828.8		
219.14	18183.7	0.05	19443.8	0.035	20533.3	0.05	22981
219.24	16912.3	0.035	19443.7	0.035	20526.2	0.035	22634.1
219.33	16863.7	0.035	19403.3	0.035	20470.3	0.035	22122.3
219.42	16604.7	0.035	19446.6	0.035	20516.7	0.035	22133.4
219.51	16558.6	0.035	19492.8	0.035	20563.5	0.035	22085.5
219.61	16748	0.035	19540.1	0.035	20570.9	0.035	22075.7
219.70	16665.8	0.035	19526.4	0.035	20550.3	0.035	22022.4
219.79	16570.4	0.035	19482.8	0.035	20481	0.035	21794.3
219.88	16543.5	0.035	19525.5	0.035	20507.2	0.035	21761.8
220.03	16984.6	0.035	19521.3	0.035	20534.7	0.035	21216.5
220.07	19209.6	0.035	19487.7	0.035	20511.8	0.035	21835.8
220.16	17382.2	0.035	19520.7	0.035	20548	0.035	21934
220.25	17388.7	0.035	19508.8	0.035	20499.3	0.035	22101.8
220.35	17357.3	0.035	19501.8	0.035	20491.5	0.035	22127.8
220.45	16653.9	0.035	19511.5	0.035	20519.7	0.035	22046.8
220.54	17647.8	0.035	19505	0.035	20500.6	0.035	22035.3
220.63	17368.8	0.035	19500.1	0.035	20475.8	0.035	21991.1
220.73	17747.8	0.035	19481.4	0.035	20493.1	0.035	21849.8
220.82	17937.2	0.035	19398	0.035	20496.5	0.035	21631.5
220.92	17979.7	0.035	19549.9	0.035	20473.8	0.035	20738.6
221.02	17812.6	0.035	19493.9	0.035	20451.6	0.035	20712.7
221.05	18637.2	0.05	19562.5	0.035	20455	0.05	20824.7
221.06	18645.2	0.05	19579.2	0.035	20458.3	0.05	20831.9
221.09	17786.1	0.05	19501	0.035	20496.8	0.05	20747.5

Salt-Gila FIS - Reach 4

	NH		STATIONS				
SEC	STA1	n1	STA2	n2	STA3	n3	STA4
221.22	18100.8	0.05	19437.7	0.035	20518.5	0.05	20736.5
221.31	18523.5	0.05	19534.6	0.035	20547.2	0.05	20633.4
221.40	18911.8	0.05	19578.8	0.035	20424.4	0.05	20584.2
221.50	18805	0.04	19578.1	0.03	20489.6	0.04	21973.4
221.61	18759	0.04	19436.4	0.03	20447.2	0.04	21409.6
221.70	18383.2	0.04	19417.4	0.03	20421.3	0.04	20977.6
221.80	18482.2	0.04	19360.1	0.03	20386.6	0.04	21280.6
221.89	18388.6	0.04	19338.9	0.03	20399	0.04	21353.1
221.99	17293.5	0.04	19375.7	0.03	20457.6	0.04	21555.7
222.07	19425.5	0.04	19551.3	0.03	20456.8	0.04	20864.6
222.10	19430.9	0.04	19541.9	0.03	20463.9	0.04	20843.6
222.17	18404.1	0.04	19459.3	0.03	20531.9	0.04	21608.5
222.27	18371	0.04	19493.2	0.03	20624.7	0.04	21510.6
222.36	18574.4	0.04	19438.8	0.03	20679.5		
222.45	18467.9	0.04	19449.4	0.03	20886		
222.55	18678.4	0.04	19506.7	0.03	21130.5		
222.65	18324.2	0.05	19536.5	0.035	20618.7	0.05	21324.6
222.74	18515.1	0.05	19573.7	0.035	20590.4	0.05	21598.8
222.83	18186.5	0.05	19468.2	0.035	20464.6	0.05	21041.8
222.93	18082.3	0.05	19389.5	0.035	20390.5	0.05	22127.8
223.02	18333.9	0.05	19334.8	0.035	20426.1	0.05	22045.2
223.07	17966.7	0.05	19320.5	0.035	20458.4	0.05	21960.8
223.10	18019.4	0.05	19287.1	0.035	20460.9	0.05	21943.8
223.19	18431.5	0.05	19142.6	0.035	20408.4	0.05	22379.5
223.29	17592.4	0.05	19017.4	0.035	20378.5	0.05	22011.5
223.38	18630.3	0.05	19541.2	0.035	20319	0.05	21979.3
223.48	18747	0.05	19487.5	0.035	20256.9	0.05	22104.4
223.58	18564.3	0.05	19508.5	0.035	20320.1	0.05	22148.9
223.67	18783.9	0.05	19434.9	0.035	20348.9	0.05	22249.2
223.77	18436.6	0.05	19437.9	0.03	20403.9	0.05	22288.3
223.86	18684.7	0.05	19338.1	0.03	20466.5	0.05	22348
223.96	18776.1	0.05	19571.6	0.035	20613.8	0.05	22262.2
224.05	18714.3	0.05	19813.6	0.035	20711.8	0.05	22213
224.15	18610.2	0.05	19835	0.035	21063.6	0.05	22161.3
224.24	18361.9	0.05	19772.6	0.035	21155.6	0.05	22137.4
224.34	18459.2	0.05	19679.2	0.035	21447.3	0.05	22539.7
224.43	18459.2	0.05	19733.6	0.035	21635.8	0.05	22568.9
224.53	18454.1	0.05	19463.7	0.035	21756.9	0.05	22545.9
224.62	18816.8	0.05	19346.9	0.035	21926.9	0.05	22497.6
224.71	18601.7	0.05	19595.1	0.035	21981.8	0.05	22792
224.81	18264.9	0.05	19386.3	0.035	22031.9	0.05	23301.9
224.90	17998	0.025	18543.6	0.03	21497.7	0.031	23525.8
225.00	17719.5	0.025	18676.4	0.03	21141.9	0.031	23398.5
225.10	17901	0.025	18537.1	0.03	21279.9	0.031	22788.2

Salt-Gila FIS - Reach 4

SEC	NH STATIONS						
	STA1	n1	STA2	n2	STA3	n3	STA4
225.19	17772.9	0.025	18660.5	0.03	20836.5	0.031	22678.9
225.28	18148.3	0.025	18664.4	0.03	20406.3	0.031	22639

100 YR N - VALUES
SALT/GILA FLOODPLAIN DELINEATION - S.O. # 19538
REACH 5

DATE: SEPTEMBER 15, 1993
BAKER ENGINEERS BY: DLT CHECKED: RLD

					NH		STATIONS						
SEC	STA1	n1	STA2	n2	STA3	n3	STA4	n4	STA5	n5	STA6	n6	STA7
225.38	18611.2	0.03	20948.6	0.029	22919.6								
225.48	18401.8	0.032	18589.5	0.028	20649	0.031	22324.4	0.032	22522.4				
225.57	18437.1	0.032	18546.1	0.028	20412.3	0.031	21432.7	0.032	22042				
225.66	18694.6	0.028	20113.6	0.031	21634.3	0.032	22190.3						
225.73	18599.4	0.028	20287.1	0.031	21435.5	0.032	21673.9						
225.85	17886.8	0.032	18128.4	0.028	20186.5	0.031	21370.5	0.032	21924.6				
225.95	17840.6	0.032	18228.4	0.028	20237.2	0.031	21174.6	0.032	21594.6				
226.04	18930.5	0.028	20903.8	0.032	21278.4								
226.13	19593.2	0.028	20609.2	0.032	21539.6								
226.23	17743.6	0.028	20608.2										
226.35	19598.4	0.028	20580.5	0.032	21305.9								
226.50	17345.9	0.029	19333.8	0.028	20618	0.032	21453.5						
226.52	17546.3	0.029	19522.9	0.028	20589.2	0.032	20994.1						
226.56													
226.61	17550	0.028	18230.1	0.031	19531.1	0.028	20581.5	0.032	21318.1				
226.70	18246.6	0.028	18900.3	0.031	19491	0.028	20724.5	0.032	21674.9				
226.80	18517.6	0.028	19227	0.031	19606.8	0.028	20598	0.032	21791.4				
226.89	18699.3	0.028	20553.4	0.032	21751.8								
226.99	18363.1	0.031	19353	0.028	20574.1	0.032	21859.4						
227.08	18806.6	0.03	19598.4	0.028	20588.8	0.032	21544.1						
227.18	18653.9	0.03	19582.3	0.028	20583.2	0.032	22652.2						
227.27	19509.1	0.028	20636.5	0.032	22262.4								
227.37	18504.3	0.03	19489.2	0.028	20492.2	0.032	21922.3						
227.46	19112.1	0.03	19537.7	0.028	20537.3	0.032	21963						
227.56	19017.6	0.032	19355.5	0.028	20597.9	0.032	21468.6						
227.61	18425.8	0.032	19367.5	0.028	20751.7	0.032	21124.5						
227.63	18212.6	0.032	19352.6	0.028	20779.9	0.032	21096.2						
227.69	17692.3	0.032	19292.4	0.028	20687.1	0.032	21553.7						
227.79	17036.6	0.032	19295.5	0.028	20696	0.032	21737						
227.88	17815	0.032	19356.4	0.028	21020.7	0.032	21950.8						
227.98	18127	0.032	19074.6	0.028	21011.6	0.032	22216.2						
228.07	18388.7	0.032	19034	0.028	20567.2	0.032	21579.1						
228.17	18384.4	0.028	20617.3	0.032	21989.7								
228.26	17980.5	0.032	18426.5	0.028	20953.5	0.032	22218.3						
228.36	17688.2	0.032	18925.7	0.028	20805.5	0.032	21871						
228.45	17630.4	0.032	18973.7	0.028	20754.4	0.032	22015.3						
228.55	18271	0.028	20889.2	0.032	22209.6								
228.64	18484.1	0.032	19728.4	0.028	20967.8								
228.74	18348.6	0.032	19838	0.028	21023.9								
228.83	18157.1	0.032	19462.1	0.028	21015.8								
228.92	17914.4	0.032	19951.6	0.028	21094.9								
229.02	18365.6	0.032	20206.9	0.028	21114.1								
229.12	17426.6	0.035	18703.8	0.032	20033.4	0.028	21208.7						
229.21	17577	0.035	18947	0.032	20233.8	0.028	21230						
229.30	19305.9	0.032	20355.4	0.028	21235.7	0.032	21487.6						
229.40	19297.9	0.032	20181.2	0.028	20971.3	0.032	21157.1						
229.50	19416.8	0.032	20067	0.028	20867.3	0.032	20972.8						
229.59	19367.2	0.037	19700	0.032	20277.5	0.028	20794.4						
229.68	19206.9	0.037	20105.5	0.028	20826.4								
229.78	19258.8	0.037	20047.2	0.028	20945								
229.87	19366.4	0.032	20024.6	0.028	20852.9	0.032	21214.7						

Salt-Gila FIS - Reach 5

					NH		STATIONS						
229.99	19196.8	0.037	19403.5	0.028	20725.6	0.037	21104.5						
230.09	18940.8	0.032	19978.4	0.028	20920.9	0.037	21371.6						
230.18	18636	0.037	19510.2	0.028	21154.1								
230.28	18410.2	0.037	19194	0.032	19732.9	0.028	20506.4	0.032	21576.8				
230.37	17994	0.037	18598.4	0.03	19129.1	0.032	19454.1	0.028	19895.2	0.032	21810.3		
230.47	18274.6	0.03	18966.3	0.032	19772.8	0.028	20186.4	0.032	22060.8				
230.56	18144.2	0.03	19139.1	0.037	19750.3	0.028	20371.4	0.032	22309.1				
230.66	17612.2	0.03	19166.2	0.032	19759	0.028	20513.8	0.032	22694.8				
230.75	18434.9	0.028	19419.8	0.037	19874.3	0.028	20755.6	0.032	23010.3				
230.84	18363.4	0.028	19412.4	0.037	20121.2	0.028	20576	0.032	23490.1				
230.94	18364.1	0.03	20345	0.037	20833.7	0.032	23533.7						
231.04	18074.5	0.043	18390	0.03	20452.9	0.037	20823.9	0.028	21489	0.037	23820.4		
231.13	17864.5	0.03	20304.8	0.037	20788.6	0.028	21407.7	0.037	24204.7				
231.23	17371.3	0.03	20430.7	0.037	20809.2	0.028	21271.6	0.037	24533.5				
231.32	17424.1	0.032	17881.5	0.028	20447.7	0.037	20847.7	0.028	21217.8	0.037	24625.1		
231.41	17327.3	0.032	18550.1	0.028	21249.1	0.037	24038.2						
231.50	17313.1	0.032	18669.7	0.028	21419.9	0.037	23168.9						
231.54	17528.3	0.032	18687.2	0.028	21451.4	0.037	23398						
231.55	17624.4	0.032	18694.5	0.028	21561.2	0.037	23370.9						
231.60	17577.3	0.032	18590	0.028	21680.4	0.037	23269.4						
231.69	17615.8	0.032	18477.5	0.028	19481.2	0.032	20826.6	0.028	21589.9	0.037	23101.1		
231.79	17568.3	0.032	18317.3	0.028	19362.3	0.037	20946.5	0.028	21734	0.037	22433.6		
231.89	17431.1	0.032	18354.2	0.028	19524.8	0.037	20983.3	0.028	21770.8	0.043	22470.5		
231.98	17605.1	0.032	18227.3	0.028	19326.1	0.037	20976.4	0.028	21910.9				
232.07	17667.7	0.032	18156.9	0.028	19431.3	0.032	20862.4	0.028	21258.7	0.032	21431.3	0.037	21981.6
232.17	17691.4	0.028	19383.2	0.032	20829.2	0.03	22143.8						
232.27	17772	0.028	19369.6	0.032	20621.8	0.03	22118	0.037	22438				
232.36	17720.3	0.028	19627.8	0.032	20367.6	0.03	21964.3	0.037	22707				
232.45	17736.5	0.028	20148.3	0.03	21697.5	0.037	21925.2						
232.55	17769.6	0.028	20139.6	0.032	20571.9	0.028	21354.6	0.037	22134.6				
232.65	17806.6	0.03	21143.6	0.032	21583.5								
232.74	18010.2	0.03	20245.9	0.032	21102.2	0.037	21631.5						
232.84	18078.7	0.03	20127.9	0.032	21195.3	0.037	21516.5						
232.93	18046.2	0.032	18290.1	0.03	20134.5	0.032	21234.7	0.037	21505.6				
233.03	18239.2	0.032	18582.7	0.028	20070.7	0.037	20472.1	0.032	20873.1	0.037	21094.9		
233.13	18047.4	0.037	18645.4	0.028	19839.9	0.037	20567.7	0.028	20886.7	0.037	21163.6		
233.22	18188.9	0.032	18654	0.028	19692	0.037	20322.1	0.028	20807.3	0.037	22284.4		
233.31	17992.1	0.032	18741.2	0.028	19659.2	0.037	20111.3	0.03	20702.9	0.037	21333.4		
233.41	18068.5	0.032	18866	0.028	19793.4	0.032	20586.7	0.037	21461.4				
233.51	18079.7	0.043	18874.3	0.028	20156.6	0.037	21522.3						
233.60	18008.2	0.043	18833.5	0.028	20233.5	0.032	20624.7	0.037	23087.5				
233.69	17942.8	0.043	18711.1	0.028	20283.7	0.037	22365.4						
233.76	18109.2	0.043	18680.6	0.028	20402.6	0.037	22379.7						
233.85	18600.9	0.028	20570.9	0.037	22467.7								
233.95	18391.6	0.028	20966.3	0.037	21886.1								
234.04	18395	0.043	18617.1	0.028	21324.5	0.037	21801						
234.14	18390.8	0.043	18731.8	0.03	21244.6	0.037	21559.1						
234.23	18636.9	0.043	18989.3	0.03	21717.2								
234.34	18867.2	0.043	19216.6	0.03	21817.6	0.037	22021						
234.44	18820.7	0.043	19122	0.03	21646.7								
234.53	18663.5	0.043	19081.8	0.032	19534.9	0.03	21519.7						
234.63	19051.5	0.032	19233.3	0.03	21269.3								
234.72	18726.7	0.032	19147.7	0.03	21222.5								
234.82	18635.5	0.032	19284.2	0.03	21193.9	0.043	21426.1						
234.91	18532.1	0.043	19023.5	0.032	19457.8	0.028	21163.2						
235.01	18859.6	0.043	19039.5	0.028	21191.5								
235.10	19078.2	0.043	19139.9	0.028	21182								
235.20	19142	0.043	19256.1	0.028	21024.4								
235.29	19054.2	0.043	19210.2	0.028	20956.7								
235.38	19139.5	0.043	19297.5	0.028	20813.5	0.043	21135.7						
235.48	19240	0.043	19397.3	0.028	20787	0.043	20892.4						

Salt-Gila FIS - Reach 5

					NH		STATIONS						
235.57	19355.7	0.028	20782.6										
235.67	19293.5	0.043	19409.2	0.028	20845								
235.76	19402.4	0.028	20998.3										
235.86	19351.4	0.028	20590.7	0.043	20953.9								
235.95	19271.9	0.028	20557.8	0.043	20939.3								
236.05	19158.7	0.028	20625.6	0.043	21115.8								
236.15	19284.6	0.028	20644.7	0.043	20880.7								
236.24	19260.7	0.043	19353.6	0.028	20432.3	0.043	20825.3						
236.34	19316.9	0.043	19482.7	0.028	20395.5	0.043	20827.6						
236.43	19385.2	0.043	19512	0.028	20477	0.037	20900						
236.53	19383.7	0.037	19590.3	0.028	20453.3	0.037	20662.6						
236.62	19284.2	0.037	19591.6	0.028	20551.2	0.043	20706.4						
236.72	19299.9	0.037	19578.9	0.028	20577.8	0.037	20647						
236.81	19238.9	0.037	19554.4	0.028	20548.9	0.037	20692.7						
236.91	19164.7	0.037	19478	0.028	20625.8	0.037	20817.2						
237.00	19253.8	0.043	19494.8	0.028	20723.7	0.037	20813.4						
237.10	19157.9	0.043	19418.7	0.028	20772.6	0.037	20880.4						
237.19	19394.3	0.043	19687.8	0.028	20809.5	0.043	20931.5						
237.29	19447.2	0.043	19616.9	0.028	20626.1	0.037	20736.1						
237.40	19314.1	0.043	19597.7	0.028	20638.3	0.037	20807.2						
237.50	19386.5	0.037	19524.5	0.028	20693.6	0.032	20820.9						

APPENDIX B

IRREGULARITY ADJUSTMENTS
Reach 1 - Reach 3

IRREGULARITY ADJUSTMENTS

The following tables were provided to show how "n" values were determined considering irregularity and vegetation. All vegetation types were categorized and assigned adjustment values. Irregularity was best determined by averaging the irregularity for each vegetation type throughout the reach. Since the irregularity does not significantly change between every cross-section, it was decided that every fifth cross-section would adequately represent the reach. In some cases, there is more than one area of a certain type of vegetation along a given cross-section, therefore, there may be more than one entry per vegetation type.

REACH 1 - IRREGULARITY ADJUSTMENTS

STATION	MEDIUM-DENSE VEG.	MEDIUM VEG.	LIGHT-MED. VEG	LIGHT VEG.
168.17			0.001	0.005
			0.002	
168.53		0.002	0.005	0.003
168.91			0.004	0.003
				0.003
169.31				0.001
169.65		0.001		0.001
170.02	0.003		0.003	0.001
			0.003	
170.34	0.010			0.003
170.79	0.007			0.002
	0.005			
171.15	0.003	0.008		0.003
171.53	0.005		0.006	
171.91		0.006		
		0.003		
172.34		0.005	0.004	
172.71		0.003		
173.27	0.004			
173.54			0.001	
173.84		0.004	0.005	
174.17	0.004		0.007	
174.56	0.007		0.001	0.003
	0.004			
174.89	0.003			0.003
	0.004			0.004
175.25	0.003			0.002
	0.004			0.004
175.72	0.004		0.004	0.004
176.10			0.003	
176.47		0.004	0.004	
176.89			0.003	0.001
				0.003
177.31		0.003		
		0.004		
177.66	0.005			
178.08	0.005			
178.50	0.006			0.003
	0.004			
178.86	0.004			0.003
	0.004			
179.25	0.004			0.003
	0.003			

STATION	MEDIUM-ENSE VEG	MEDIUM VEG.	LIGHT-MED. VEG	LIGHT VEG.
179.68	0.009	0.005		0.003
180.06	0.003		0.004	
180.47	0.005			0.004
				0.005
180.85		0.005		0.005
		0.002		0.003
181.23				0.005
181.74			0.002	
182.08	0.006		0.004	
			0.003	
182.45	0.004	0.005		
Sum	0.132	0.060	0.069	0.083
Number	28	15	20	27
AVERAGE	0.005	0.004	0.003	0.003
BASE N-VALUE	0.025	0.025	0.025	0.025
VEG. ADJUST.	0.035	0.014	0.009	0.004

OVERALL N-VALUE = AVERAGE + BASE N-VALU + VEG. ADJUST.

OVERALL N-VALUE	0.065	0.043	0.037	0.032

REACH 2 - IRREGULARITY ADJUSTMENTS

STATION	MEDIUM-ENSE VEG	MEDIUM VEG.	LIGHT-MED. VEG	LIGHT VEG.
182.55	0.004	0.005		
182.92	0.004	0.004		
183.30	0.004	0.003		
183.67	0.004	0.004	0.002	
184.05		0.007		
		0.001		
184.53		0.003		
184.81	0.006		0.003	
185.19	0.004			
185.53	0.004			
185.90	0.003			
186.97	0.004			
187.36	0.005			
187.73	0.004			0.004
188.05	0.003			0.003
188.29	0.005			
188.70	0.005	0.004		
189.12	0.005			0.002
189.49	0.005			0.002
189.87		0.004		
190.24	0.004			
190.62	0.003	0.004		
	0.002			
190.99	0.003	0.006		0.004
191.36	0.002	0.007		0.004
191.75	0.007	0.005		0.003
192.13	0.005	0.004		0.003
192.51	0.003	0.006		0.003
192.88		0.006		0.003
193.24		0.005		0.004
193.65		0.004		
193.93		0.004		0.004
194.19		0.002		
194.62		0.004		0.003
195.00				0.004
				0.003
195.15		0.003		0.003

STATION	MEDIUM-ENSE VEG	MEDIUM VEG.	LIGHT-MED. VEG.	LIGHT VEG.
195.47		0.004		0.003
195.85	0.005			
196.23		0.004		0.003
196.61		0.004		
196.98				0.004
197.35	0.004	0.004		0.003
197.74	0.004	0.004		0.003
198.11		0.004		
198.34		0.002		
198.66				0.004
199.04				0.004
199.44		0.003		0.002
199.82		0.003		
Sum	0.111	0.127	0.005	0.078
Number	27	31	2	24
AVERAGE	0.004	0.004	0.003	0.003
BASE N-VALUE	0.025	0.025	0.025	0.025
VEG. ADJUST.	0.036	0.014	0.009	0.004

OVERALL N-VALUE = AVERAGE + BASE N-VALU + VEG. ADJUST.

OVERALL N-VALUE	0.065	0.043	0.037	0.032

REACH 3 - IRREGULARITY ADJUSTMENTS

STATION	MEDIUM-ENSE VEG	MEDIUM VEG.	LIGHT-MED. VEG.	LIGHT VEG.
199.91		0.003		0.004
		0.004		
200.39		0.006		0.005
		0.004		
200.77		0.003	0.004	0.003
201.14	0.005	0.003	0.006	0.004
			0.007	
201.52		0.004		0.004
201.99		0.006	0.005	0.008
202.37		0.006	0.003	
202.80		0.004	0.002	
203.19		0.002	0.008	
203.67			0.005	0.003
204.05			0.003	0.001
204.42			0.005	
204.78			0.007	
205.15			0.005	
205.62		0.004		0.002
206.03		0.006		0.005
206.41		0.004		0.003
206.79		0.004		0.003
207.27		0.007		0.005
207.62		0.005		0.003
207.99		0.005		0.002
208.39		0.005	0.004	0.002
208.75			0.004	0.003
			0.003	
209.24			0.004	0.003
			0.003	
209.60			0.004	0.003
			0.003	
209.98			0.003	0.004
210.36			0.004	0.003
210.74			0.005	0.003
			0.003	
211.21			0.004	0.003
			0.003	

STATION	MEDIUM-ENSE VEG	MEDIUM VEG.	LIGHT-MED. VEG	LIGHT VEG.
211.54			0.004	0.003
			0.003	
211.99			0.004	0.003
			0.003	
212.37			0.007	0.005
			0.003	
212.84			0.005	0.004
			0.003	
213.21			0.003	0.002
			0.003	
213.57			0.003	0.005
			0.003	
213.95			0.003	0.004
			0.003	
214.14			0.003	0.003
			0.003	
Sum	0.005	0.085	0.163	0.108
Number	1	19	41	31
AVERAGE	0.005	0.004	0.004	0.003
BASE N-VALUE	0.025	0.025	0.025	0.02[illegible]
VEG. ADJUST.	0.035	0.014	0.008	0.004

OVERALL N-VALUE = AVERAGE + BASE N-VALUE + VEG. ADJUST.

OVERALL N-VALUE	0.065	0.043	0.037	0.032

APPENDIX C

CLEARED CHANNEL "n" VALUES
Reach 1 - Reach 2
Reach 4 - Reach 5

REACH 1 - CLEARED CHANNEL N-VALUES

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
166.42	NA			
166.49	NA			
166.56	NA			
166.57	NA			
166.60	0.025	0.003	0.001	0.029
166.64	0.025	0.003	0.001	0.029
166.67	0.025	0.003	0	0.028
166.77	0.025	0.003	0	0.028
166.86	0.025	0.004	0	0.029
166.95	0.025	0.005	0	0.03
167.05	0.025	0.005	0	0.03
167.13	0.025	0.007	0	0.032
167.18	0.025	0.006	0	0.031
167.23	0.025	0.006	0	0.031
167.34	0.025	0.004	0	0.029
167.43	0.025	0.003	0.001	0.029
167.52	0.025	0.002	0.001	0.028
167.62	0.025	0.001	0.001	0.027
167.71	0.025	0.003	0.001	0.029
167.81	0.025	0.003	0.001	0.029
167.90	0.025	0.005	0.001	0.031
167.99	0.025	0.005	0.001	0.031
168.08	0.025	0.004	0.001	0.03
168.17	0.025	0.004	0.001	0.03
168.26	0.025	0.004	0.001	0.03
168.34	0.025	0.003	0.001	0.029
168.44	0.025	0.002	0.001	0.028
168.53	0.025	0.003	0.001	0.029
168.63	0.025	0.004	0.001	0.03
168.72	0.025	0.002	0.002	0.029
168.81	0.025	0.005	0.002	0.032
168.91	0.025	0.004	0.001	0.03
168.99	0.025	0.002	0.002	0.029
169.07	0.025	0.002	0.002	0.029
169.17	0.025	0.002	0.001	0.028
169.24	0.025	0.003	0.001	0.029
169.31	0.025	0.002	0.001	0.028
169.38	0.025	0.002	0.001	0.028
169.46	0.025	0.003	0.001	0.029
169.55	0.025	0.003	0.001	0.029
169.65	0.025	0.004	0.001	0.03
169.74	0.025	0.002	0.001	0.028

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
169.83	0.025	0.003	0.001	0.029
169.92	0.025	0.004	0.001	0.03
170.02	0.025	0.003	0.001	0.029
170.09	0.025	0.004	0.001	0.03
170.16	0.025	0.004	0.001	0.03
170.25	0.025	0.004	0.001	0.03
170.34	0.025	0.003	0.001	0.029
170.43	0.025	0.003	0.001	0.029
170.52	0.025	0.004	0.001	0.03
170.61	0.025	0.003	0.001	0.029
170.70	0.025	0.003	0.001	0.029
170.79	0.025	0.003	0.001	0.029
170.89	0.025	0.005	0.001	0.031
171.00	0.025	0.005	0.001	0.031
171.06	0.025	0.006	0.001	0.032
171.15	0.025	0.005	0.001	0.031
171.25	0.025	0.003	0.001	0.029
171.34	0.025	0.001	0.001	0.027
171.43	0.025	0.001	0.001	0.027
171.53	0.025	0.003	0	0.028
171.63	0.025	0.002	0	0.027
171.71	0.025	0.002	0	0.027
171.80	0.025	0.002	0	0.027
171.91	0.025	0.004	0	0.029
172.02	0.025	0.002	0	0.027
172.09	0.025	0.003	0	0.028
172.16	0.025	0.005	0	0.03
172.24	0.025	0.006	0	0.031
172.34	0.025	0.004	0	0.029
172.43	0.025	0.003	0	0.028
172.52	0.025	0.004	0	0.029
172.61	0.025	0.003	0.001	0.029
172.71	0.025	0.001	0.001	0.027
172.79	0.025	0.001	0.001	0.027
172.84	0.025	0.003	0.001	0.029
172.89	0.025	0.003	0	0.028
172.99	0.025	0.001	0	0.026
173.08	0.025	0.002	0	0.027
173.18	0.025	0.001	0	0.026
173.27	0.025	0.001	0	0.026
173.37	0.025	0.001	0.001	0.027
173.46	0.025	0.002	0.001	0.028
173.51	0.025	0.004	0.001	0.03
173.58	0.025	0.004	0.001	0.03
173.63	0.025	0.005	0.001	0.031

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
173.71	0.025	0.005	0.001	0.031
173.77	0.025	0.003	0.001	0.029
173.84	0.025	0.004	0.001	0.03
173.91	0.025	0.003	0	0.028
173.99	0.025	0.003	0	0.028
174.08	0.025	0.003	0	0.028
174.17	0.025	0.004	0	0.029
174.28	0.025	0.004	0	0.029
174.38	0.025	0.005	0	0.03
174.43	0.025	0.004	0	0.029
174.47	0.025	0.003	0	0.028
174.56	0.025	0.003	0	0.028
174.65	0.025	0.005	0	0.03
174.73	0.025	0.005	0.001	0.031
174.81	0.025	0.005	0.003	0.033
174.89	0.025	0.003	0.005	0.033
174.96	0.025	0.003	0.003	0.031
175.05	0.025	0.004	0	0.029
175.15	0.025	0.004	0	0.029
175.25	0.025	0.004	0	0.029
175.34	0.025	0.003	0	0.028
175.44	0.025	0.003	0	0.028
175.53	0.025	0.005	0	0.03
175.62	0.025	0.005	0	0.03
175.72	0.025	0.004	0	0.029
175.81	0.025	0.004	0	0.029
175.91	0.025	0.002	0	0.027
176.00	0.025	0.003	0	0.028
176.10	0.025	0.003	0	0.028
176.19	0.025	0.004	0	0.029
176.28	0.025	0.004	0	0.029
176.37	0.025	0.005	0	0.03
176.47	0.025	0.005	0	0.03
176.56	0.025	0.003	0	0.028
176.65	0.025	0.005	0	0.03
176.75	0.025	0.002	0	0.027
176.80	0.025	0.003	0	0.028
176.84	0.025	0.003	0	0.028
176.89	0.025	0.003	0	0.028
176.93	0.025	0.003	0	0.028
177.03	0.025	0.003	0	0.028
177.12	0.025	0.003	0	0.028
177.22	0.025	0.003	0	0.028
177.31	0.025	0.003	0	0.028
177.40	0.025	0.003	0	0.028

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
177.48	0.025	0.003	0	0.028
177.58	0.025	0.002	0	0.027
177.66	0.025	0.003	0	0.028
177.75	0.025	0.003	0	0.028
177.80	0.025	0.003	0	0.028
177.84	0.025	0.003	0	0.028
177.92	0.025	0.003	0	0.028
178.00	0.025	0.002	0	0.027
178.08	0.025	0.003	0	0.028
178.17	0.025	0.003	0	0.028
178.26	0.025	0.003	0	0.028
178.33	0.025	0.003	0	0.028
178.40	0.025	0.003	0	0.028
178.50	0.025	0.002	0	0.027
178.55	0.025	0.003	0	0.028
178.61	0.025	0.002	0	0.027
178.68	0.025	0.003	0	0.028
178.77	0.025	0.002	0	0.027
178.86	0.025	0.001	0	0.026
178.95	0.025	0.003	0	0.028
179.03	0.025	0.003	0	0.028
179.11	0.025	0.003	0	0.028
179.20	0.025	0.003	0	0.028
179.25	0.025	0.003	0	0.028
179.30	0.025	0.002	0	0.027
179.35	0.025	0.003	0	0.028
179.40	0.025	0.003	0	0.028
179.50	0.025	0.003	0	0.028
179.59	0.025	0.003	0	0.028
179.68	0.025	0.004	0	0.029
179.76	0.025	0.003	0	0.028
179.84	0.025	0.004	0.001	0.03
179.91	0.025	0.003	0.001	0.029
180.01	0.025	0.004	0.001	0.03
180.02	0.025	0.004	0.001	0.03
180.03	0.025	0.003	0.001	0.029
180.04	0.025	0.003	0.001	0.029
180.06	0.025	0.003	0.001	0.029
180.09	0.025	0.003	0.001	0.029
180.18	0.025	0.003	0.001	0.029
180.28	0.025	0.005	0.001	0.031
180.37	0.025	0.005	0.001	0.031
180.47	0.025	0.006	0.002	0.033
180.56	0.025	0.004	0.002	0.031
180.65	0.025	0.004	0.002	0.031

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
180.75	0.025	0.004	0.001	0.03
180.85	0.025	0.003	0.001	0.029
180.94	0.025	0.003	0.001	0.029
180.99	0.025	0.003	0.001	0.029
181.04	0.025	0.003	0.001	0.029
181.13	0.025	0.003	0.001	0.029
181.23	0.025	0.003	0.001	0.029
181.32	0.025	0.003	0.002	0.03
181.41	0.025	0.004	0.002	0.031
181.51	0.025	0.004	0.001	0.03
181.62	0.025	0.003	0.001	0.029
181.74	0.025	0.003	0.001	0.029
181.82	0.025	0.003	0.001	0.029
181.90	0.025	0.003	0.001	0.029
181.99	0.025	0.003	0.001	0.029
182.08	0.025	0.004	0.001	0.03
182.17	0.025	0.004	0.001	0.03
182.27	0.025	0.003	0.001	0.029
182.36	0.025	0.003	0.001	0.029
182.45	0.025	0.004	0.001	0.03

REACH 2 - CLEARED CHANNEL N-VALUES

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
182.55	0.025	0.003	0.002	0.03
182.64	0.025	0.003	0.002	0.03
182.74	0.025	0.003	0.002	0.03
182.83	0.025	0.003	0.002	0.03
182.92	0.025	0.003	0.002	0.03
183.02	0.025	0.001	0.002	0.028
183.11	0.025	0.001	0.002	0.028
183.20	0.025	0.001	0.002	0.028
183.30	0.025	0.001	0	0.026
183.39	0.025	0.001	0	0.026
183.49	0.025	0.001	0	0.026
183.58	0.025	0.001	0	0.026
183.67	0.025	0.001	0	0.026
183.77	0.025	0.001	0	0.026
183.86	0.025	0.001	0	0.026
183.96	0.025	0.001	0	0.026
184.05	0.025	0.001	0	0.026
184.14	0.025	0.001	0	0.026
184.24	0.025	0.001	0	0.026
184.33	0.025	0.001	0	0.026
184.43	0.025	0.003	0	0.028
184.53	0.025	0.003	0	0.028
184.62	0.025	0.003	0	0.028
184.71	0.025	0.003	0	0.028
184.81	0.025	0.003	0	0.028
184.90	0.025	0.003	0	0.028
185.00	0.025	0.003	0	0.028
185.10	0.025	0.001	0	0.026
185.19	0.025	0.001	0	0.026
185.28	0.025	0.001	0	0.026
185.38	0.025	0.001	0	0.026
185.46	0.025	0.001	0	0.026
185.53	0.025	0.004	0	0.029
185.61	0.025	0.004	0	0.029
185.71	0.025	0.004	0	0.029
185.81	0.025	0.004	0	0.029
185.90	0.025	0.004	0	0.029
186.00	0.025	0.004	0	0.029

Salt-Gila FIS - Reach 2

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
186.10	0.025	0.003	0	0.028
186.19	0.025	0.003	0	0.028
186.27	0.025	0.003	0	0.028
186.36	0.025	0.003	0	0.028
186.46	0.025	0.003	0	0.028
186.55	0.025	0.003	0	0.028
186.61	0.025	0.003	0	0.028
186.69	0.025	0.003	0	0.028
186.78	0.025	0.003	0	0.028
186.87	0.025	0.003	0	0.028
186.97	0.025	0.003	0	0.028
187.06	0.025	0.003	0	0.028
187.15	0.025	0.003	0.002	0.03
187.24	0.025	0.003	0.002	0.03
187.36	0.025	0.003	0.002	0.03
187.45	0.025	0.003	0.002	0.03
187.54	0.025	0.003	0.002	0.03
187.64	0.025	0.003	0.002	0.03
187.73	0.025	0.003	0.002	0.03
187.82	0.025	0.003	0.002	0.03
187.91	0.025	0.003	0.002	0.03
188.00	0.025	0.003	0.002	0.03
188.05	0.025	0.003	0.002	0.03
188.06	0.025	0.003	0.002	0.03
188.10	0.025	0.003	0.002	0.03
188.20	0.025	0.003	0.002	0.03
188.29	0.025	0.001	0	0.026
188.39	0.025	0.001	0	0.026
188.50	0.025	0.003	0	0.028
188.59	0.025	0.003	0	0.028
188.70	0.025	0.003	0	0.028
188.81	0.025	0.003	0	0.028
188.92	0.025	0.002	0	0.027
189.02	0.025	0.002	0	0.027
189.12	0.025	0.002	0	0.027
189.22	0.025	0.002	0	0.027
189.31	0.025	0.002	0	0.027
189.39	0.025	0.002	0	0.027
189.49	0.025	0.002	0	0.027
189.58	0.025	0.002	0	0.027
189.68	0.025	0.002	0	0.027

Salt-Gila FIS - Reach 2

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
189.77	0.025	0.002	0	0.027
189.87	0.025	0.001	0	0.026
189.96	0.025	0.001	0	0.026
190.05	0.025	0.001	0	0.026
190.15	0.025	0.001	0	0.026
190.24	0.025	0.001	0	0.026
190.34	0.025	0.001	0	0.026
190.43	0.025	0.001	0	0.026
190.53	0.025	0.001	0	0.026
190.62	0.025	0.001	0	0.026
190.71	0.025	0.001	0	0.026
190.80	0.025	0.001	0	0.026
190.89	0.025	0.001	0	0.026
190.99	0.025	0.001	0	0.026
191.08	0.025	0.001	0	0.026
191.17	0.025	0.001	0	0.026
191.27	0.025	0.001	0	0.026
191.36	0.025	0.001	0	0.026
191.46	0.025	0.001	0	0.026
191.55	0.025	0.001	0	0.026
191.65	0.025	0.001	0	0.026
191.75	0.025	0.001	0	0.026
191.84	0.025	0.001	0	0.026
191.94	0.025	0.001	0	0.026
192.04	0.025	0.001	0	0.026
192.13	0.025	0.001	0	0.026
192.23	0.025	0.001	0	0.026
192.33	0.025	0.001	0	0.026
192.42	0.025	0.001	0	0.026
192.51	0.025	0.001	0	0.026
192.60	0.025	0.002	0.002	0.029
192.69	0.025	0.002	0.002	0.029
192.78	0.025	0.002	0.002	0.029
192.88	0.025	0.002	0.002	0.029
192.97	0.025	0.002	0.002	0.029
193.07	0.025	0.002	0.002	0.029
193.16	0.025	0.002	0.002	0.029
193.24	0.025	0.002	0.002	0.029
193.36	0.025	0.002	0.002	0.029
193.45	0.025	0.003	0.003	0.031
193.54	0.025	0.003	0.003	0.031

Salt-Gila FIS - Reach 2

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
193.65	0.025	0.003	0.003	0.031
193.71	0.025	0.003	0.003	0.031
193.78	0.025	0.003	0.003	0.031
193.86	0.025	0.003	0.003	0.031
193.93	0.025	0.003	0.003	0.031
194.01	0.025	0.003	0.003	0.031
194.09	0.025	0.003	0.003	0.031
194.19	0.025	0.003	0.003	0.031
194.20	0.025	0.003	0.003	0.031
194.29	0.025	0.003	0.003	0.031
194.40	0.025	0.003	0.003	0.031
194.53	0.025	0.003	0.003	0.031
194.62	0.025	0.003	0.003	0.031
194.72	0.025	0.003	0.003	0.031
194.81	0.025	0.003	0.003	0.031
194.91	0.025	0.003	0.003	0.031
195.00	0.025	0.003	0.003	0.031
195.09	0.025	0.003	0.003	0.031
195.14	0.025	0.003	0.003	0.031
195.15	0.025	0.003	0.003	0.031
195.19	0.025	0.003	0.003	0.031
195.28	0.025	0.003	0.003	0.031
195.38	0.025	0.003	0.003	0.031
195.47	0.025	0.003	0.003	0.031
195.56	0.025	0.003	0.003	0.031
195.66	0.025	0.003	0.003	0.031
195.75	0.025	0.003	0.003	0.031
195.85	0.025	0.003	0.003	0.031
195.94	0.025	0.003	0.003	0.031
196.04	0.025	0.001	0.002	0.028
196.13	0.025	0.001	0.002	0.028
196.23	0.025	0.001	0.002	0.028
196.32	0.025	0.001	0.002	0.028
196.42	0.025	0.001	0.002	0.028
196.51	0.025	0.001	0.002	0.028
196.61	0.025	0.003	0.002	0.03
196.70	0.025	0.003	0.002	0.03
196.79	NA	NA	NA	0
196.88	NA	NA	NA	0
196.98	NA	NA	NA	0
197.07	NA	NA	NA	0

Salt-Gila FIS - Reach 2

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
197.16	NA	NA	NA	0
197.26	NA	NA	NA	0
197.35	NA	NA	NA	0
197.45	NA	NA	NA	0
197.54	NA	NA	NA	0
197.64	NA	NA	NA	0
197.74	NA	NA	NA	0
197.83	NA	NA	NA	0
197.92	NA	NA	NA	0
198.02	NA	NA	NA	0
198.11	0.025	0.003	0.002	0.03
198.20	0.025	0.003	0.002	0.03
198.26	0.025	0.003	0.002	0.03
198.30	0.025	0.003	0.002	0.03
198.34	0.025	0.003	0.002	0.03
198.40	0.025	0.003	0.002	0.03
198.49	0.025	0.001	0.002	0.028
198.59	0.025	0.001	0.002	0.028
198.66	0.025	0.001	0.002	0.028
198.75	NA	NA	NA	0
198.85	NA	NA	NA	0
198.94	NA	NA	NA	0
199.04	NA	NA	NA	0
199.15	NA	NA	NA	0
199.24	NA	NA	NA	0
199.30	NA	NA	NA	0
199.34	NA	NA	NA	0
199.44	NA	NA	NA	0
199.53	NA	NA	NA	0
199.63	NA	NA	NA	0
199.72	NA	NA	NA	0
199.82	NA	NA	NA	0

REACH 4 - CLEARED CHANNEL N-VALUES

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
214.23	0.025	0.006	0.004	0.035
214.33	0.025	0.006	0.004	0.035
214.42	0.025	0.006	0.004	0.035
214.52	0.025	0.006	0.004	0.035
214.71	0.025	0.006	0.004	0.035
214.77	0.025	0.006	0.004	0.035
214.79	0.025	0.006	0.004	0.035
214.90	0.025	0.006	0.004	0.035
214.99	0.025	0.006	0.004	0.035
215.09	0.025	0.006	0.004	0.035
215.18	0.025	0.006	0.004	0.035
215.27	0.025	0.006	0.004	0.035
215.36	0.025	0.006	0.004	0.035
215.46	0.025	0.006	0.004	0.035
215.56	0.025	0.006	0.004	0.035
215.65	0.025	0.006	0.004	0.035
215.75	0.025	0.006	0.004	0.035
215.80	0.025	0.006	0.004	0.035
215.82	0.025	0.006	0.004	0.035
215.84	0.025	0.006	0.004	0.035
215.94	0.025	0.006	0.004	0.035
216.04	0.025	0.006	0.004	0.035
216.13	0.025	0.006	0.004	0.035
216.23	0.025	0.006	0.004	0.035
216.33	0.025	0.006	0.004	0.035
216.42	0.025	0.006	0.004	0.035
216.48	0.025	0.006	0.004	0.035
216.53	0.025	0.006	0.004	0.035
216.62	0.025	0.006	0.004	0.035
216.72	0.025	0.006	0.004	0.035
216.81	0.025	0.006	0.004	0.035
216.91	0.025	0.006	0.004	0.035
217.00	0.025	0.006	0.004	0.035
217.10	0.025	0.006	0.004	0.035
217.19	0.025	0.006	0.004	0.035
217.29	0.025	0.006	0.004	0.035
217.38	0.025	0.006	0.004	0.035
217.48	0.025	0.006	0.004	0.035

Salt-Gila FIS - Reach 4

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
217.57	0.025	0.006	0.004	0.035
217.66	0.025	0.006	0.004	0.035
217.76	0.025	0.006	0.004	0.035
217.86	0.025	0.006	0.004	0.035
217.95	0.025	0.006	0.004	0.035
218.04	0.025	0.006	0.004	0.035
218.14	0.025	0.006	0.004	0.035
218.24	0.025	0.006	0.004	0.035
218.33	0.025	0.006	0.004	0.035
218.42	0.025	0.006	0.004	0.035
218.52	0.025	0.006	0.004	0.035
218.61	0.025	0.006	0.004	0.035
218.71	0.025	0.006	0.004	0.035
218.80	0.025	0.006	0.004	0.035
219.00	0.025	0.006	0.004	0.035
219.04	0.025	0.006	0.004	0.035
219.14	0.025	0.006	0.004	0.035
219.24	0.025	0.006	0.004	0.035
219.33	0.025	0.006	0.004	0.035
219.42	0.025	0.006	0.004	0.035
219.51	0.025	0.006	0.004	0.035
219.61	0.025	0.006	0.004	0.035
219.70	0.025	0.006	0.004	0.035
219.79	0.025	0.006	0.004	0.035
219.88	0.025	0.006	0.004	0.035
220.03	0.025	0.006	0.004	0.035
220.07	0.025	0.006	0.004	0.035
220.16	0.025	0.006	0.004	0.035
220.25	0.025	0.006	0.004	0.035
220.35	0.025	0.006	0.004	0.035
220.45	0.025	0.006	0.004	0.035
220.54	0.025	0.006	0.004	0.035
220.63	0.025	0.006	0.004	0.035
220.73	0.025	0.006	0.004	0.035
220.82	0.025	0.006	0.004	0.035
220.92	0.025	0.006	0.004	0.035
221.02	0.025	0.006	0.004	0.035
221.05	0.025	0.006	0.004	0.035
221.06	0.025	0.006	0.004	0.035
221.19	0.025	0.006	0.004	0.035
221.22	0.025	0.006	0.004	0.035

Salt-Gila FIS - Reach 4

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
221.31	0.025	0.006	0.004	0.035
221.40	0.025	0.006	0.004	0.035
221.50	0.028	0.002	0.000	0.03
221.61	0.028	0.002	0.000	0.03
221.70	0.028	0.002	0.000	0.03
221.80	0.028	0.002	0.000	0.03
221.89	0.028	0.002	0.000	0.03
221.99	0.028	0.002	0.000	0.03
222.07	0.028	0.002	0.000	0.03
222.10	0.028	0.002	0.000	0.03
222.17	0.028	0.002	0.000	0.03
222.27	0.028	0.002	0.000	0.03
222.36	0.028	0.002	0.000	0.03
222.45	0.028	0.002	0.000	0.03
222.55	0.028	0.002	0.000	0.03
222.65	0.028	0.004	0.003	0.035
222.74	0.028	0.004	0.003	0.035
222.83	0.028	0.004	0.003	0.035
222.93	0.028	0.004	0.003	0.035
223.07	0.028	0.004	0.003	0.035
223.10	0.028	0.004	0.003	0.035
223.19	0.028	0.004	0.003	0.035
223.29	0.028	0.004	0.003	0.035
223.38	0.028	0.004	0.003	0.035
223.48	0.028	0.004	0.003	0.035
223.58	0.028	0.004	0.003	0.035
223.67	0.028	0.004	0.003	0.035
223.77	0.028	0.002	0.000	0.03
223.86	0.028	0.002	0.000	0.03
223.96	0.028	0.004	0.003	0.035
224.05	0.028	0.004	0.003	0.035
224.15	0.028	0.004	0.003	0.035
224.24	0.028	0.004	0.003	0.035
224.34	0.028	0.004	0.003	0.035
224.43	0.028	0.004	0.003	0.035
224.53	0.028	0.004	0.003	0.035
224.62	0.028	0.004	0.003	0.035
224.71	0.028	0.004	0.003	0.035
224.81	0.028	0.004	0.003	0.035
224.90	0.028	0.002	0.000	0.03
225.00	0.028	0.002	0.000	0.03

Salt-Gila FIS - Reach 4

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
225.10	0.028	0.002	0.000	0.03
225.19	0.028	0.002	0.000	0.03
225.28	0.028	0.002	0.000	0.03

REACH 5 - CLEARED CHANNEL N-VALUES

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
225.38	0.028	0.002	0.000	0.03
	0.025	0.003	0.001	0.029
225.48	0.028	0.002	0.000	0.03
	0.025	0.003	0.003	0.031
225.57	0.028	0.002	0.000	0.03
	0.025	0.003	0.003	0.031
225.66	0.028	0.002	0.000	0.03
	0.025	0.003	0.003	0.031
225.76	0.028	0.002	0.000	0.03
	0.025	0.003	0.003	0.031
225.85	0.028	0.002	0.000	0.03
	0.025	0.003	0.003	0.031
225.95	0.028	0.002	0.000	0.03
	0.025	0.003	0.003	0.031
226.04	0.028	0.000	0.000	0.028
226.13	0.028	0.000	0.000	0.028
226.23	0.028	0.000	0.000	0.028
226.35	0.028	0.000	0.000	0.028
226.50	0.025	0.003	0.001	0.029
	0.028	0.000	0.000	0.028
226.52	0.025	0.003	0.001	0.029
	0.028	0.000	0.000	0.028
226.56	0.028	0.000	0.000	0.028
226.61	0.028	0.000	0.000	0.028
	0.025	0.003	0.003	0.031
226.70	0.028	0.000	0.000	0.028
	0.025	0.003	0.003	0.031
226.80	0.028	0.000	0.000	0.028
	0.025	0.003	0.003	0.031
226.89	0.028	0.000	0.000	0.028
226.99	0.025	0.003	0.003	0.031
	0.028	0.000	0.000	0.028
227.08	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
227.18	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
227.27	0.028	0.000	0.000	0.028
227.37	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028

Salt-Gila FIS - Reach 5

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
227.46	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
227.56	0.028	0.000	0.000	0.028
227.61	0.028	0.000	0.000	0.028
227.63	0.028	0.000	0.000	0.028
227.69	0.028	0.000	0.000	0.028
227.79	0.028	0.000	0.000	0.028
227.88	0.028	0.000	0.000	0.028
227.98	0.028	0.000	0.000	0.028
228.07	0.028	0.000	0.000	0.028
228.17	0.028	0.000	0.000	0.028
228.26	0.028	0.000	0.000	0.028
228.36	0.028	0.000	0.000	0.028
228.45	0.028	0.000	0.000	0.028
228.55	0.028	0.000	0.000	0.028
228.64	0.028	0.000	0.000	0.028
228.74	0.028	0.000	0.000	0.028
228.83	0.028	0.000	0.000	0.028
228.92	0.028	0.000	0.000	0.028
229.02	0.028	0.000	0.000	0.028
229.12	0.028	0.000	0.000	0.028
229.21	0.028	0.000	0.000	0.028
229.30	0.028	0.000	0.000	0.028
229.40	0.028	0.000	0.000	0.028
229.50	0.028	0.000	0.000	0.028
229.59	0.028	0.000	0.000	0.028
229.68	0.028	0.000	0.000	0.028
229.78	0.028	0.000	0.000	0.028
229.87	0.028	0.000	0.000	0.028
229.99	0.028	0.000	0.000	0.028
230.09	0.028	0.000	0.000	0.028
230.18	0.028	0.000	0.000	0.028
230.28	0.028	0.000	0.000	0.028
230.37	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
230.47	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
230.56	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
230.66	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
230.75	0.028	0.000	0.000	0.028

Salt-Gila FIS - Reach 5

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
230.84	0.028	0.000	0.000	0.028
230.94	0.028	0.002	0.000	0.03
231.04	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
231.13	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
231.23	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
231.32	0.028	0.000	0.000	0.028
231.41	0.028	0.000	0.000	0.028
231.50	0.028	0.000	0.000	0.028
231.54	0.028	0.000	0.000	0.028
231.55	0.028	0.000	0.000	0.028
231.60	0.028	0.000	0.000	0.028
231.69	0.028	0.000	0.000	0.028
231.79	0.028	0.000	0.000	0.028
231.89	0.028	0.000	0.000	0.028
231.98	0.028	0.000	0.000	0.028
232.07	0.028	0.000	0.000	0.028
232.17	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
232.27	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
232.36	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
232.45	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
232.55	0.028	0.000	0.000	0.028
232.65	0.028	0.002	0.000	0.03
232.74	0.028	0.002	0.000	0.03
232.84	0.028	0.002	0.000	0.03
232.93	0.028	0.002	0.000	0.03
233.03	0.028	0.000	0.000	0.028
233.13	0.028	0.000	0.000	0.028
233.22	0.028	0.000	0.000	0.028
233.31	0.028	0.002	0.000	0.03
	0.028	0.000	0.000	0.028
233.41	0.028	0.000	0.000	0.028
233.51	0.028	0.000	0.000	0.028
233.60	0.028	0.000	0.000	0.028
233.69	0.028	0.000	0.000	0.028
233.76	0.028	0.000	0.000	0.028

Salt-Gila FIS - Reach 5

SECTION	BASE N-VALUE	IRREG.	VEG.	ADJUSTED N-VALUE
233.85	0.028	0.000	0.000	0.028
233.95	0.028	0.000	0.000	0.028
234.04	0.028	0.000	0.000	0.028
234.14	0.028	0.002	0.000	0.03
234.23	0.028	0.002	0.000	0.03
234.34	0.028	0.002	0.000	0.03
234.44	0.028	0.002	0.000	0.03
234.53	0.028	0.002	0.000	0.03
234.63	0.028	0.002	0.000	0.03
234.72	0.028	0.002	0.000	0.03
234.82	0.028	0.002	0.000	0.03
234.91	0.028	0.000	0.000	0.028
235.01	0.028	0.000	0.000	0.028
235.10	0.028	0.000	0.000	0.028
235.20	0.028	0.000	0.000	0.028
235.29	0.028	0.000	0.000	0.028
235.38	0.028	0.000	0.000	0.028
235.48	0.028	0.000	0.000	0.028
235.57	0.028	0.000	0.000	0.028
235.67	0.028	0.000	0.000	0.028
235.76	0.028	0.000	0.000	0.028
235.86	0.028	0.000	0.000	0.028
235.95	0.028	0.000	0.000	0.028
236.05	0.028	0.000	0.000	0.028
236.15	0.028	0.000	0.000	0.028
236.24	0.028	0.000	0.000	0.028
236.34	0.028	0.000	0.000	0.028
236.43	0.028	0.000	0.000	0.028
236.53	0.028	0.000	0.000	0.028
236.62	0.028	0.000	0.000	0.028
236.72	0.028	0.000	0.000	0.028
236.81	0.028	0.000	0.000	0.028
236.91	0.028	0.000	0.000	0.028
237.00	0.028	0.000	0.000	0.028
237.10	0.028	0.000	0.000	0.028
237.19	0.028	0.000	0.000	0.028
237.29	0.028	0.000	0.000	0.028
237.40	0.028	0.000	0.000	0.028
237.50	0.028	0.000	0.000	0.028
237.59	0.028	0.000	0.000	0.028

APPENDIX D

URBAN ROUGHNESS COEFFICIENT

S.O. No. 19538

Subject: SALT / GILA FIS

N-VALUE CALCULATION FOR URBAN AREAS

Sheet No. 1 of 4

Drawing No.

Computed by KJT Checked By Date 1/94

Baker

URBAN ROUGHNESS COEFFICIENT, n_u

$$n_u = n_o\left[\frac{3}{2}\left(\frac{W_T}{\Sigma W_o}\right) + \left(1 - \frac{W_T}{\Sigma W_o}\right)\frac{\Sigma L_o}{L_T} - \frac{1}{2}\right]$$

n_o = roughness coefficient for area between buildings on a flood plain

$\frac{W_T}{\Sigma W_o}$ = ratio of total width to summation of the individual widths between buildings of a cross-section through a row of buildings perpendicular to the direction of flow

$\frac{\Sigma L_o}{L_T}$ = ratio of summation of distances between rows of buildings to total reach lengths along a profile parallel to the direction of flow

S.O. No. 19538

Subject: SALT/GILA FIS

N-VALUE CALCULATION FOR URBAN AREAS

Sheet No. 2 of 4

Drawing No.

Computed by KJT Checked By Date 1/94

Baker

HOLLY ACRES - @ EL MIRAGE, S. OF SOUTHERN - SECTIONS 198.26 - 198.49

$n_o = 0.035$ area is basically clear with some obstructions

$W_T = 2550$

$W_1 = 75$
$W_2 = 110$
$W_3 = 80$
$W_4 = 75$
$W_5 = 110$
$W_6 = 105$
$W_7 = 100$
$W_8 = 75$
$W_9 = 120$
$W_{10} = 225$
$W_{11} = 425$

$\Sigma W_o = 1500$

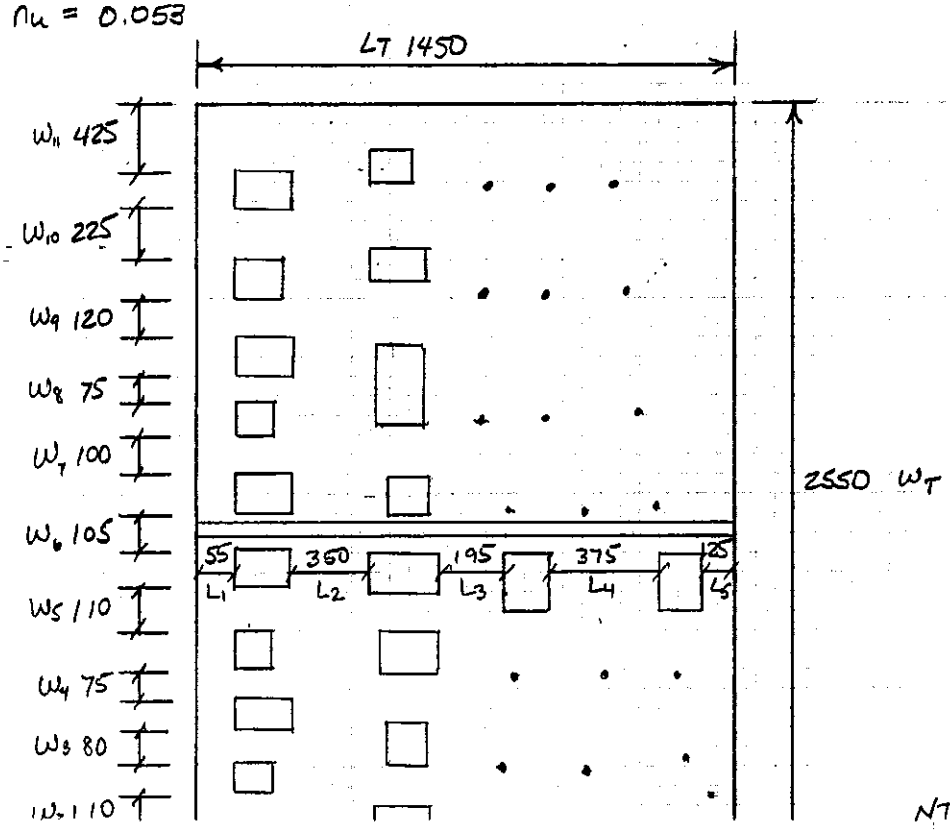
$L_T = 1450$

$L_1 = 55$
$L_2 = 350$
$L_3 = 195$
$L_4 = 375$
$L_5 = 125$

$\Sigma L_o = 1100$

$$n_u = 0.035\left[\frac{3}{2}\left(\frac{2550}{1500}\right) + \left(1 - \frac{2550}{1500}\right)\frac{1100}{1450} - \frac{1}{2}\right]$$

$n_u = 0.053$



NTS

S.O. No. 19538

Subject: SALT / GILA FIS

N-VALUE CALCULATION FOR URBAN AREAS

Sheet No. 3 of 4

Drawing No.

Computed by KJT Checked By Date 1/94

Baker

115TH AVENUE - SECTIONS 199.34 - 199.44

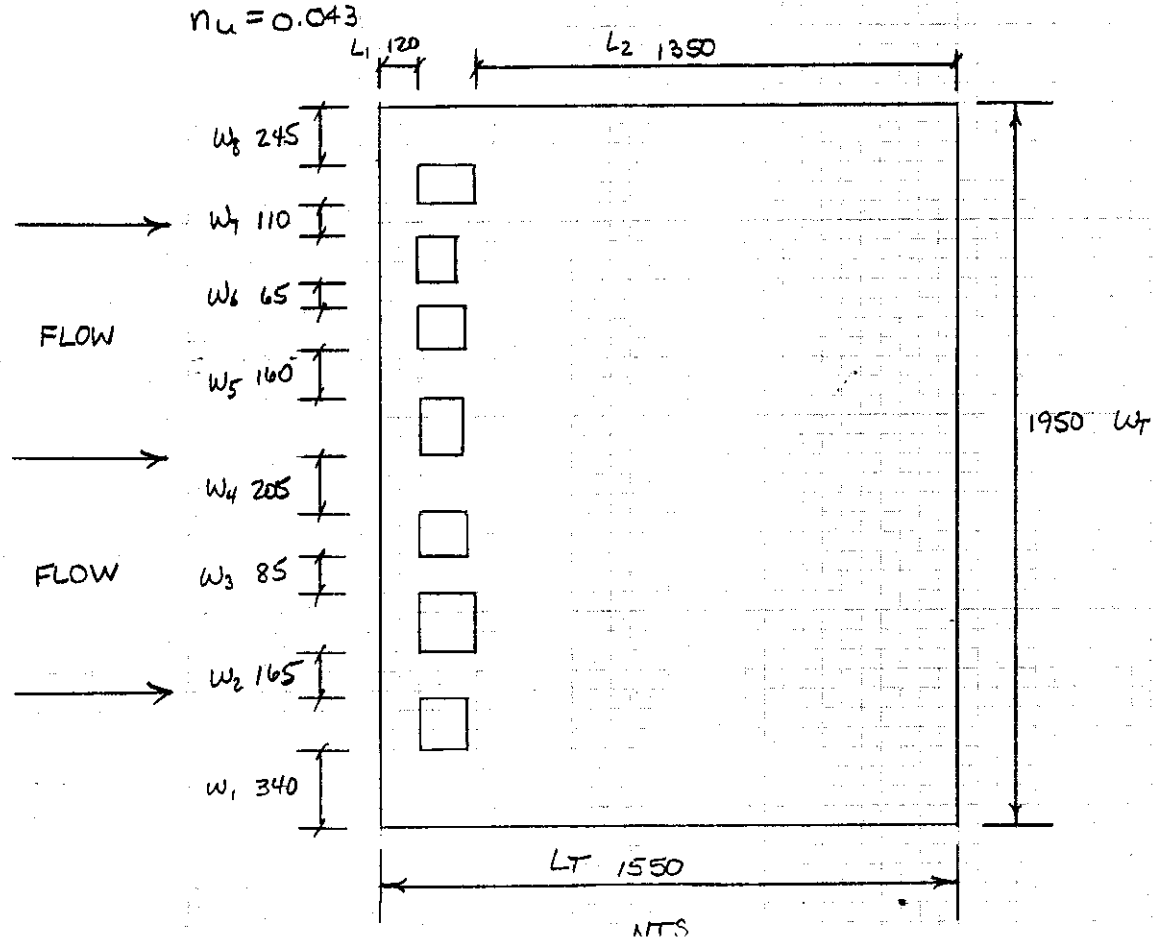
$n_o = 0.035$

$W_T = 1950$	
$W_1 = 340$	
$W_2 = 165$	
$W_3 = 85$	
$W_4 = 205$	
$W_5 = 160$	
$W_6 = 65$	
$W_7 = 110$	
$W_8 = 245$	
$\Sigma W_o = 1375$	

$L_T = 1550$	
$L_1 = 120$	
$L_2 = 1350$	
$\Sigma L_o = 1470$	

$$n_u = 0.035\left[\frac{3}{2}\left(\frac{1950}{1375}\right) + \left(1 - \frac{1950}{1375}\right)\left(\frac{1470}{1550}\right) - \frac{1}{2}\right]$$

$n_u = 0.043$



S.O. No. 19538

Subject: SALT / GILA FIS

N-VALUE CALCULATION FOR URBAN AREAS

Sheet No. 4 of 4

Drawing No.

Computed by KJT Checked By Date 1/94

Baker

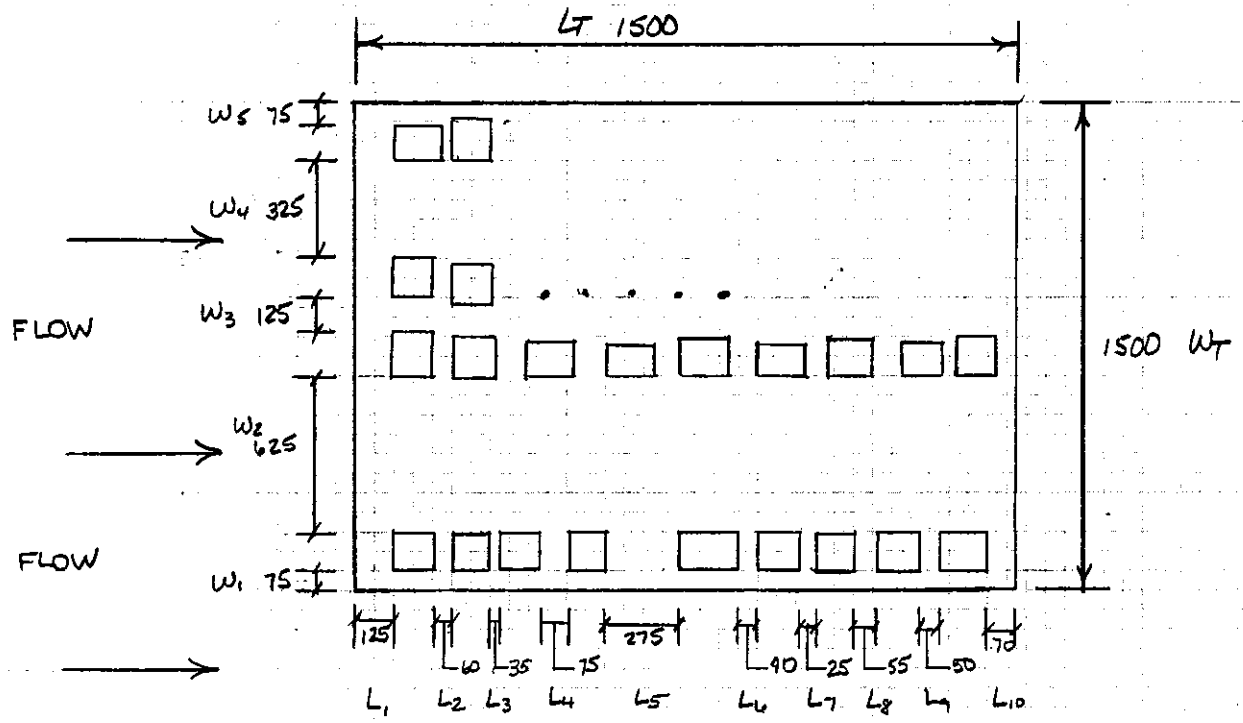
SUBDIVISION – N. OF SOUTHERN AVE, W. OF EL MIRAGE – SECTIONS 197.26 - 197.45
197.92 - 198.20

$n_b = 0.035$

$W_T = 1500$	$L_T = 1500$
$W_1 = 75$	$L_1 = 125$
$W_2 = 650$	$L_2 = 60$
$W_3 = 125$	$L_3 = 35$
$W_4 = 325$	$L_4 = 75$
$W_5 = 75$	$L_5 = 275$
$\Sigma W_0 = 1250$	$L_6 = 40$
	$L_7 = 25$
	$L_8 = 55$
	$L_9 = 50$
	$L_{10} = 70$
	$\Sigma L_0 = 810$

$$n_u = 0.035\left[\tfrac{3}{2}\left(\frac{1500}{1250}\right) + \left(1 - \frac{1500}{1250}\right)\frac{810}{1500} - \tfrac{1}{2}\right]$$

$n_u = 0.042$



NTS

APPENDIX E

CALIBRATION ANALYSIS
Reach 1 - Reach 3
Reach 5

APPENDIX E
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* *Note:* Reach 4 was not calibrated due to new channelization throughout.

CALIBRATION OF THE SALT/GILA HEC-2 MODEL

Purpose:

The goal of calibration is to obtain a set of parameters (n-values) so that the model (HEC-2) will respond like the physical system it intends to represent. The calibration procedure used past flooding events to verify the current HEC-2 model and to validate n-values and ineffective areas. It is recognized that the topography has changed due to subsequent flooding events and from activities in the floodplain. Cross-sections were compared to existing HEC-2 and from previous FIS and analyzed as accurately as possible with the available data.

Procedure:

The Salt/Gila FIS has been calibrated according to the following procedure:

1. The aerial flood photos from February 1980 were used to choose points to compare with existing (1992-93) mapping along both sides of the river, e.g., streets, bridges, landmarks.
2. Once all points were chosen, the current topographic plans and cross-sections were used to select the closest cross-section to these points.
3. These cross-sections were placed in a calibration model HEC-2 file.
4. The flood flow in 1980 was estimated to be 170,000 cfs per Maricopa County Flood Control District. This flow was assumed throughout the entire reach (Granite Reef to Gillespie Dam).
5. This Q was used in the HEC-2 run of the representative cross-sections for the model.
6. The current n-values and ineffective areas were assumed to be the same for the purposes of calibration.
7. The resulting water surface elevation and the elevation at points from the flood photos were compared.
8. The points from the flood photos were located on the 1992-93 topographic plan and the appropriate elevation correlated to the flood elevation.
9. All points were tabulated and compared to the current HEC-2 runs. (See attached table)
10. Profiles were prepared to show the comparison between the 1980 flood points and the current HEC-2 points. (See attached profiles)
11. Cross-sections of the current HEC-2 model and previous HEC-2 models were plotted and compared to determine how the channel has changed over the last 10 years.

Conclusion:

In general, the result of the above calibration procedure indicates the HEC-2 model produces reasonable results consistent with previous flood events and FIS studies. However, there are several items that may be questionable which can be explained or justified.

- The scale of the 1980 photos is very small, 1" = 2000 ft so landmark identification was difficult. There is also the possibility that, in certain areas, the actual flight path of the aircraft was not accurate, resulting in a variation of scale. This could be due to unforeseen circumstances, e.g., other aircraft in the area or turbulence.
- There is limited data regarding flood information for the Salt and Gila Rivers since flooding rarely occurs in the Phoenix area. All related agencies (USACOE, USGS, FCDMC) were contacted and the best available data has been used.
- The topography in the floodplain has changed from the previous 1980 flood either from natural reasons; e.g., sedimentation, vegetative growth, erosion, or human activity; e.g., gravel operations, bridge construction, development encroachments, and channelization.
- Differences in comparison data such as the top width and CWSEL, are subjective. For example, in the area around Gilbert Road, the topography in the river and overbanks is extremely flat. An even minor increase in water surface elevation can result in a very large increase in top width.

CALIBRATION MODEL

1980 Flood Photos
Q = 170,000 cfs

Date: April 7, 1994
By: KJT Checked: TEK

* Elevation based on approximate flood water elevation from 1980
** Elevations taken in location of current 20,000 baseline.
*** Previous FIS elevations based on 245,000 cfs

See Note #4 for information

POINT DESCRIPTION	CURRENT X-SECTION	ELEV. '80 PHOTO LEFT	ELEV. '80 PHOTO RIGHT	ELEV. OF NEW HEC-2	ELEV. W/ n-VALUE + 10%	ELEV. W/ n-VALUES x 2	***ELEV. FIS VALUES	**CURRENT GRND ELEV.	**1980 GRND ELEV.
Gillespie Dam	166.57	Too steep to determine pts		760.36	760.36	760.36	761.7	734.5	734.5
Desert Rose Rd	169.92	Points could not be found		772.18	772.82	776.54	776.6	760.3	759.0
Cactus Rose Rd	171.43	No point	777	776.15	776.86	780.27	781.0	770.7	773.0
331st Ave	172.09	780	784	780.85	781.32	783.83	784.8	771.6	771.5
Road at tip of bluff (Arlington)	172.99	784	785	785.95	786.69	790.12	791.0	777.4	776.0
Arlington Canal - W Hass. R.	174.81	798	No point	798.59	799.05	802.81	803.8	779.0	779.0
Just E. of Bruner Rd	176.00	800	803	802.46	803.00	807.02	806.3	787.7	792.0
Palo Verde Rd	177.03	806	809	806.15	806.73	810.79	810.2	794.5	796.0
Wilson Rd	178.00	815	813	810.80	811.80	815.14	815.7	798.7	804.0
SR 80 Bridge	180.01	826	826	825.09	825.86	827.76	831.3	815.1	812.0
Rooks Rd	180.94	833	831	832.00	832.22	834.49	835.5	823.1	818.5
Miller Rd	182.17	839	836	837.15	837.61	840.34	841.6	827.4	828.0
Apache Rd	183.20	840	847	841.03	841.51	844.83	847.0	831.0	832.0
Watson Rd	184.14	849	848	847.23	847.80	851.40	853.0	837.1	846.0
Rainbow Rd	185.28	858	859	856.05	856.65	860.14	859.1	841.6	854.0
Dean Rd	186.10	860	863	860.25	860.86	864.41	863.3	848.7	852.0
Airport Rd	187.06	866	868	866.71	867.30	870.62	871.0	851.9	856.0
Perryville Rd	190.15	887	885	886.55	887.18	890.73	886.9	876.0	876.0
Cotton Ln	192.33	No point	891	896.08	896.74	900.10	896.0	885.4	884.0
Sarival Rd	193.24	Points could not be found		899.99	900.62	904.07	902.7	895.3	891.0
Dysart Rd	197.26	928	928	928.06	928.46	931.86	927.1	916.7	909.9
El Mirage Rd	198.30	937	937	937.41	937.93	940.36	955.0	933.8	915.0
115th Ave	199.30	944	943	944.43	944.98	947.36	942.8	933.1	925.0
107th Ave	200.30	Points could not be found		950.01	950.63	953.56	949.7	940.7	935.6

POINT DESCRIPTION	CURRENT X-SECTION	ELEV. '80 PHOTO LEFT	ELEV. '80 PHOTO RIGHT	ELEV. OF NEW HEC-2	ELEV. W/ n-VALUE + 10%	ELEV. W/ n-VALUES x 2	***ELEV. FIS VALUES	**CURRENT GRND ELEV.	**1980 GRND ELEV.
99th Ave	201.24			-	-	-	956.6	950.6	954.0
91st Ave	202.29	Unable to calibrate		-	-	-	965.5	956.2	955.0
83rd Ave	203.48	due to		-	-	-	976.3	964.4	968.5
75th Ave	204.53	missing		-	-	-	986.9	973.6	976.0
67th Ave	205.40	flood photos		-	-	-	992.8	976.1	978.5
59th Ave	206.51			-	-	-	1002.1	990.5	991.0
51st Ave	207.48	1011	1009	1011*	-	-	1010.8	999.2	999.0
43rd Ave	208.57	1021	1022	1022.83	-	-	1022.6	1014.7	1016.0
35th Ave	209.53	1033	1033	1036.30	-	-	1032.4	1041.8	1021.0
27th Ave	210.55	1040	1040	1040.77	-	-	1042.2	1018.0	1032.0
19th Ave	211.54	1044	1044	1044.95	-	-	1051.6	1030.2	1032.0
7th Ave	212.69	1064	1067	1063.90	-	-	1062.3	1041.9	1039.0
Central Ave	213.24	1070	1071	1067.65	-	-	1067.2	1045.5	1042.5
7th St	213.73	1070	1073	1068.84	-	-	1071.5	1048.1	1049.5
16th St	214.77	Calibration		Sections	-	-	1083.7	1059.3	1061.0
24th St	215.80	not		begin	-	-	1093.5	1076.2	1076.5
I - 10	216.48	possible		to be	-	-	1106.2	1083.3	1082.0
REACH 4	—			channelized	-	-	—	—	—
Alma School Road	—	New bridge since 1980		1198.6	-	-	1202.1	1185.0	1185.0
Country Club Road	227.61	New bridge since 1980		1205.0	-	-	1213.6	1195.0	1098.0
E of Country Club Road	228.36	1206	1210	1208.9	-	-	1220.6	1200.0	1200.2
Horne Road	229.87	1228	1226	1226.1	-	-	1233.6	1222.0	1220.2
Stapely Drive	230.47	1236	1234	1234.6	-	-	1237.3	1232.0	1233.5
Gilbert Road	231.54	1250	1249	1250.4	-	-	1247.2	1246.0	1248.5
E of Lindsay Road	232.74	1258	1259	1258.1	-	-	1261.0	1248.0	1261.5
Val Vista Drive	233.51	1268	1265	1268.9	-	-	1265.6	1263.0	1263.0
Betwn Val Vista & G.R. Dam	235.48	1284	1284	1283.1	-	-	1280.9	1280.0	1278.5
Granite Reef Dam	237.59	1300	1300	1298.7	-	-	1302.4	1287.0	1277.0

ASSUMPTIONS AND NOTES:

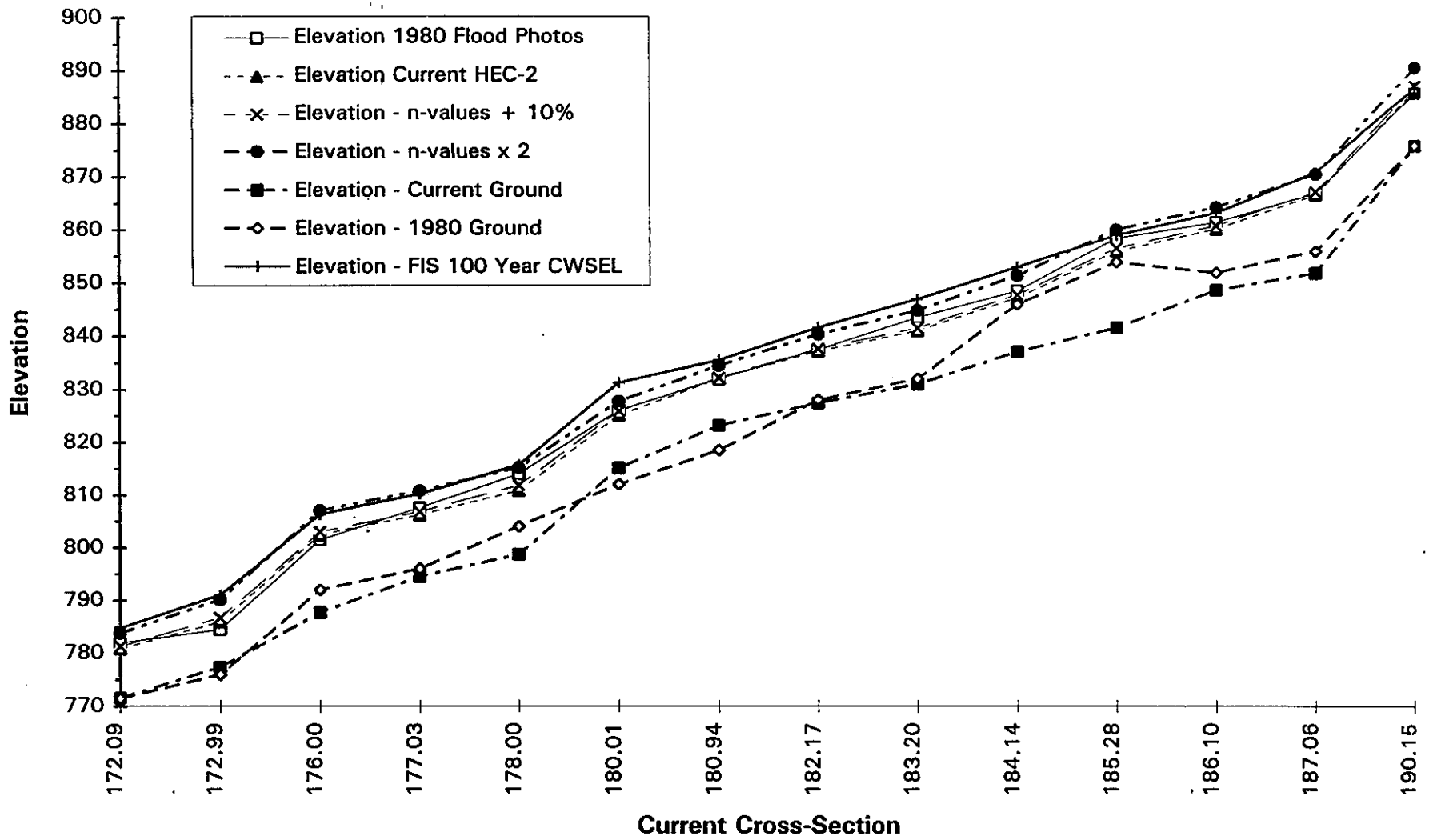
1. If no bridge existed in 1980 where one exists today, the section immediately downstream was used for comparison unless the topography was greatly changed.

2. Sections were chosen such that spacing averaged approximately one per mile. Certain areas did not have any easily identifiable points.

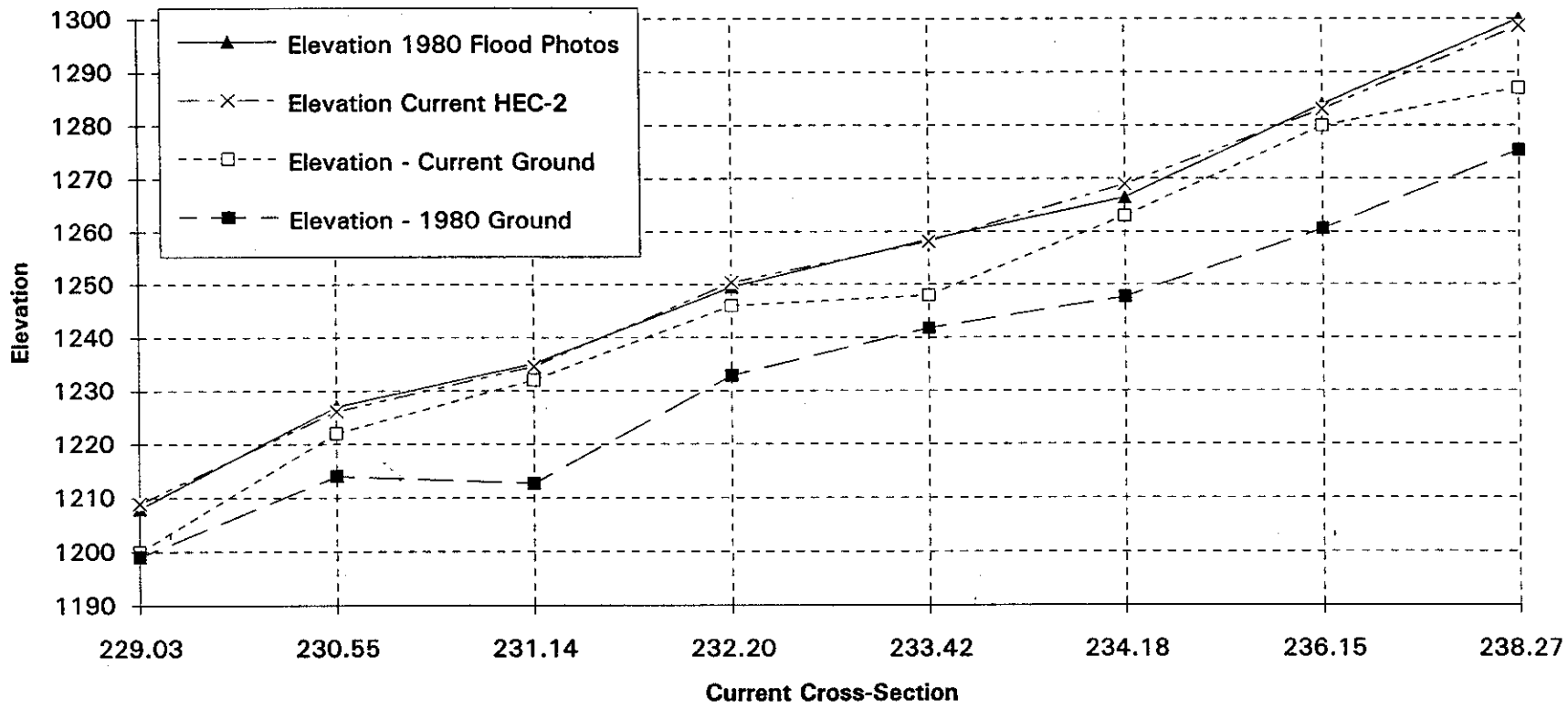
3. The channelized portion of the river could not be calibrated since it was completed after 1980.

4. N-value sensitivity was evaluated by demonstrating how the water surface changes with an increase of 10% and 100% in n-values. A 10% increase in n-values did not significantly alter the computed water surface elevation compared to the current water surface elevation. However, a 100% increase in n-values raised the water surface 2'-4'. Since the original HEC-2 run with the current n-values produced water surface elevations which were within 10% of the 1980 flood elevations, it was assumed that the current n-values are realistic for the present HEC-2 model.

Calibration Model Elevations



Calibration Model Elevations - Reach 5



CALIBRATION MODEL - TOP WIDTHS

1980 Flood Photos
Q = 170,000 cfs

Date: April 28, 1994
By: KJT Checked: TEK

POINT DESCRIPTION	CURRENT X-SECTION	TOP WIDTH NEW HEC-2	TOP WIDTH PREV. HEC-2	TOP WIDTH *DIFFERENCE	% DIFF. NEW HEC-2
Gillespie Dam	166.57	1662.48	1704.48	42.00	2.53%
Desert Rose Rd	169.92	8238.48	8217	-21.48	0.26%
Cactus Rose Rd	171.43	8352.07	8944.64	592.57	7.09%
331st Ave	172.09	6275.77	6466.3	190.53	3.04%
Road at tip of bluff (Arlington)	172.99	2912.43	2756	-156.43	5.37%
Arlington Canal - W Hass. R.	174.81	4489.72	3648.64	-841.08	18.73%
Just E. of Bruner Rd	176.00	6637.14	7093.09	455.95	6.87%
Palo Verde Rd	177.03	4229.42	4774.01	544.59	12.88%
Wilson Rd	178.00	7019.09	7050.29	31.20	0.44%
SR 80 Bridge	180.01	10070.86	7258.11	-2812.75	27.93%
Rooks Rd	180.94	10512.27	9972.5	-539.77	5.13%
Miller Rd	182.17	6485.31	7318.28	832.97	12.84%
Apache Rd	183.20	5328.90	5747.86	418.96	7.86%
Watson Rd	184.14	3731.33	7189	3457.67	92.67%
Rainbow Rd	185.28	4856.75	7179.96	2323.21	47.83%
Dean Rd	186.10	6346.55	6347.92	1.37	0.02%
Airport Rd	187.06	4154.77	4652.65	497.88	11.98%
Perryville Rd	190.15	5476.39	5062.17	-414.22	7.56%
Cotton Ln	192.33	6382.34	6719.13	336.79	5.28%
Sarival Rd	193.24	4050.08	4130.34	80.26	1.98%
Dysart Rd	197.26	5910.04	6714.56	804.52	13.61%

POINT DESCRIPTION	CURRENT X-SECTION	TOP WIDTH NEW HEC-2	TOP WIDTH PREV. HEC-2	TOP WIDTH *DIFFERENCE	% DIFF. NEW HEC-2
El Mirage Rd	198.30	7519.76	Unavailable	-	-
115th Ave	199.30	8716.82	8299.79	-417.03	4.78%
107th Ave	200.30	7662.18	7662.41	0.23	0.00%
51st Ave	207.48	1598.20	3138.82	1540.62	96.40%
43rd Ave	208.57	1906.74	2881.4	974.66	51.12%
35th Ave	209.53	3474.40	3583.47	109.07	3.14%
27th Ave	210.55	3146.80	1955.13	-1191.67	37.87%
19th Ave	211.54	713.02	969.19	256.17	35.93%
7th Ave	212.69	717.85	1171.7	453.85	63.22%
Central Ave	213.24	973.10	832.9	-140.20	14.41%
7th St	213.73	640.58	642.14	1.56	0.24%
16th St	214.77	1083.82	Unavailable	-	-
24th St	215.80	845.04	Unavailable	-	-
I - 10	216.48	1012.00	Unavailable	-	-
Alma School Road	226.50	1315.05	Unavailable	-	-
Country Club Road	227.61	1261.06	1334.08	73.02	5.79%
East of Country Club Road	228.36	1591.46	1641.59	50.13	3.15%
Home Road	229.87	1139.31	1298.14	158.83	13.94%
Stapely Drive	230.47	2796.30	2741.63	-54.67	1.96%
Gilbert Road	231.54	2604.02	2900.76	296.74	11.40%
East of Lindsay Road	232.74	2442.72	3270	827.28	33.87%
Val Vista Drive	233.51	1673.82	2080	406.18	24.27%
Betwn Val Vista & G.R. Dam	235.48	1298.16	1380.28	82.12	6.33%
Granite Reef Dam	237.59	1015.69	1181.17	165.48	16.29%

Calibration Analysis -- Cross-Section Comparison

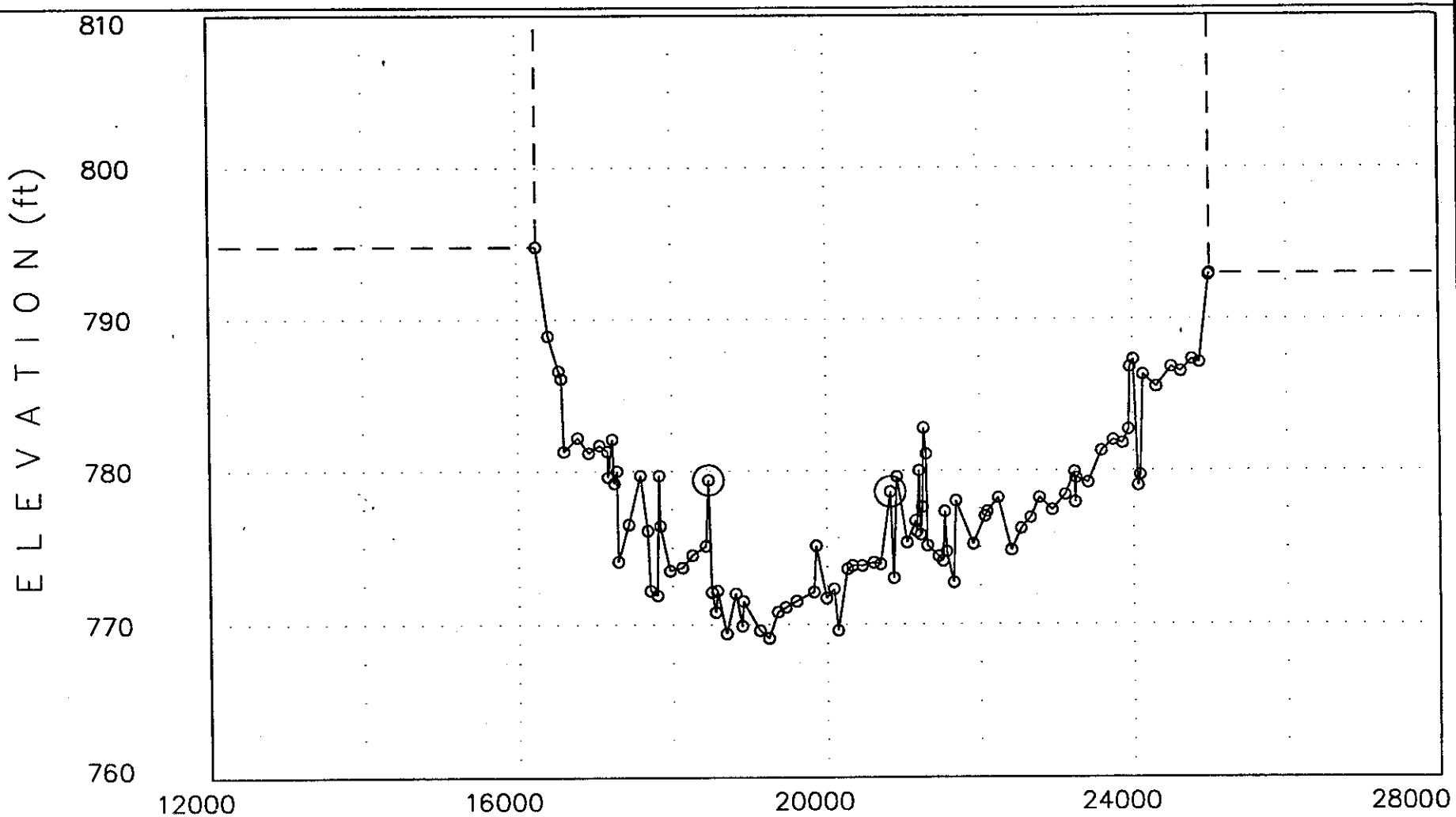
*Note: The first cross-section number listed represents the current river mile stationing. The second cross-section number listed represents the previous FIS stationing.

REACH 1

Cross - Section	Approx. Location	Previous Contractor	Date of Aerial Flight/Map Co.	X-Sect. Comparison
172.09/112	331st Avenue	Dames & Moore	1985 Kenney Aerial Mapping	Minor changes in cross-section geometry
172.99/124	Road at tip of bluff (Arlington)	Dames & Moore	1985 Kenney Aerial Mapping	Minor changes in cross-section geometry
174.81/144	Arlington Canal W. of Hassayampa River	Dames & Moore	1985 Kenney Aerial Mapping	Center of channel appears filled with sed.
176.00/160	E. of Bruner Rd.	Dames & Moore	1985 Kenney Aerial Mapping	Minor changes in cross-section geometry
177.03/172	Palo Verde Rd.	Dames & Moore	1985 Kenney Aerial Mapping	Very little change in geometry
178.00/182	Wilson Rd.	Dames & Moore	1985 Kenney Aerial Mapping	Channel geometry is much less irregular
180.01/204	SR 85 Bridge	Dames & Moore	1984 Aerial Mapping Co.	Channel has filled with sed. in center
180.94/218	Rooks Rd.	Dames & Moore	1984 Aerial Mapping Co.	Channel has filled with sed. in center
182.17/232	Miller Rd.	Dames & Moore	1984 Aerial Mapping Co.	Channel has changed little

Throughout this portion of Reach 1, it appears that the river channel has changed very little in the past 10 years. The minor changes that have occurred, have taken place where sediment has filled the center portion of the main channel. In general, the channel seems to have become less irregular than it was a decade ago. However, from Gillespie Dam to just south of the bend in the river, the channel changed dramatically due to the January 1993 flood. The alignment of the main channel shifted and became more irregular.

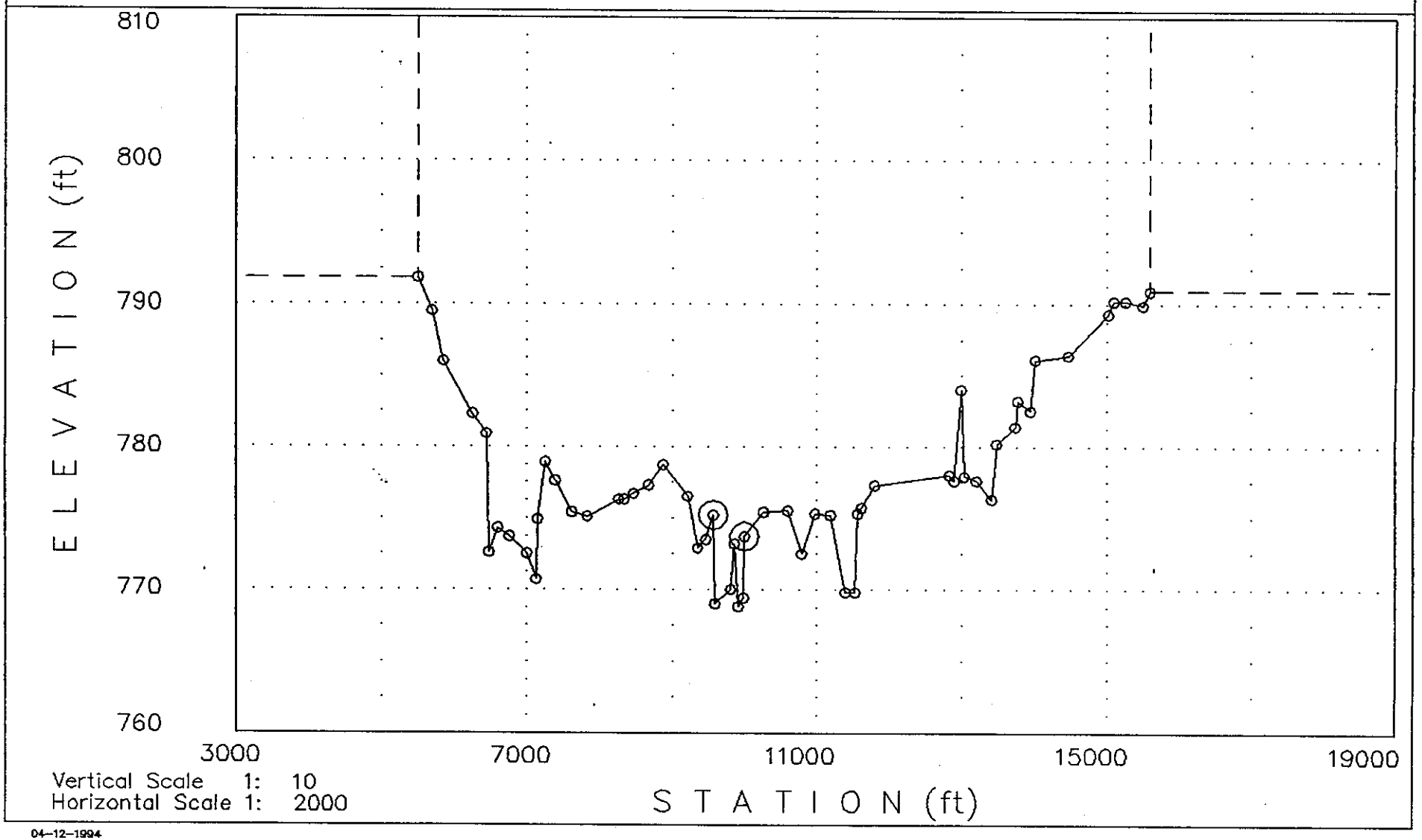
<<<<<< Cross Section: 172.37: (FN = R1IA.DAT) >>>>>>



Vertical Scale 1: 10
Horizontal Scale 1: 2000

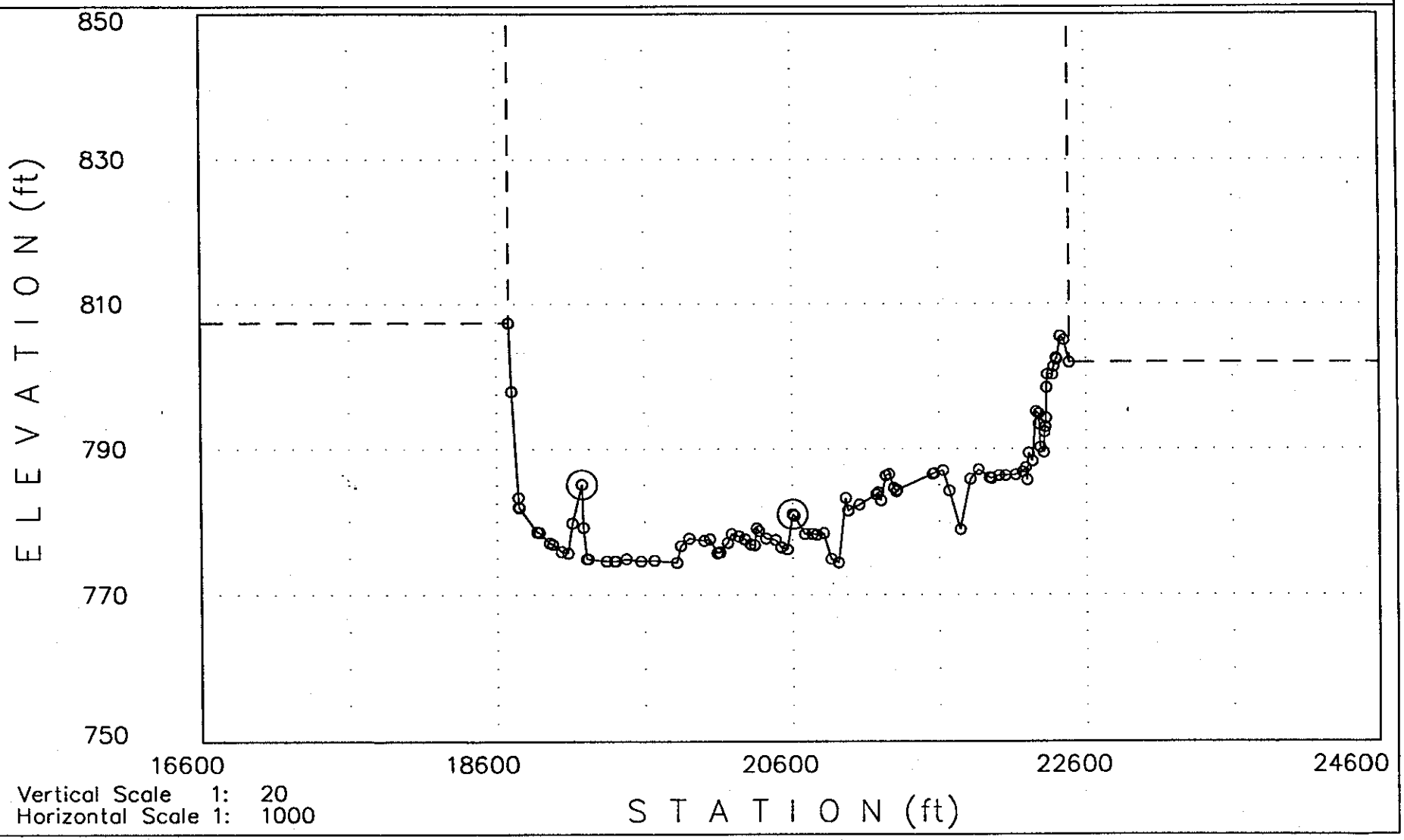
04-11-1994

<<<<<< Cross Section: 112: (FN = 2FCD100.DAT) >>>>>>



04-12-1994

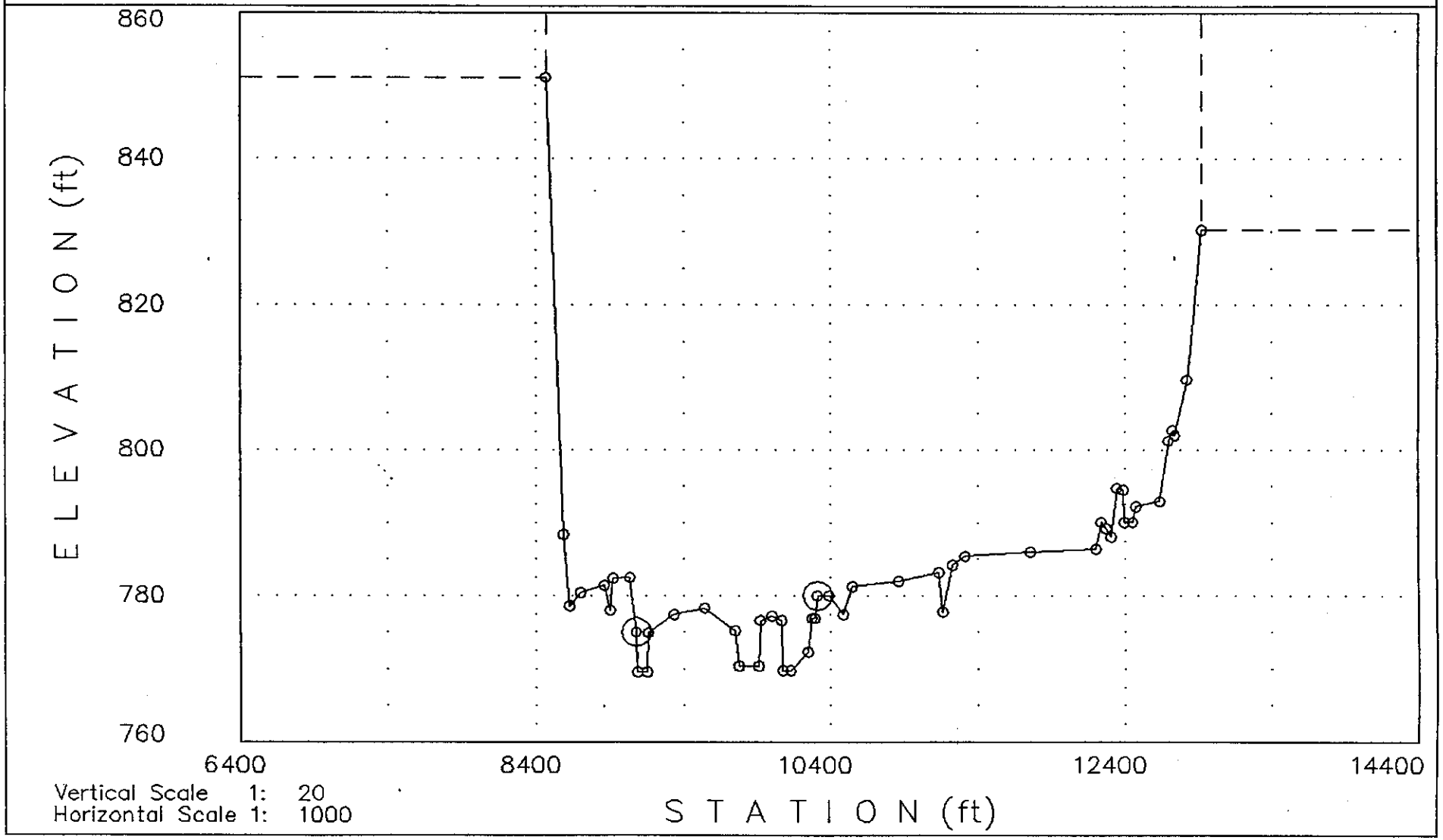
<<<<<< Cross Section: 173.3: (FN = R1IA.DAT) >>>>>>



Vertical Scale 1: 20
Horizontal Scale 1: 1000

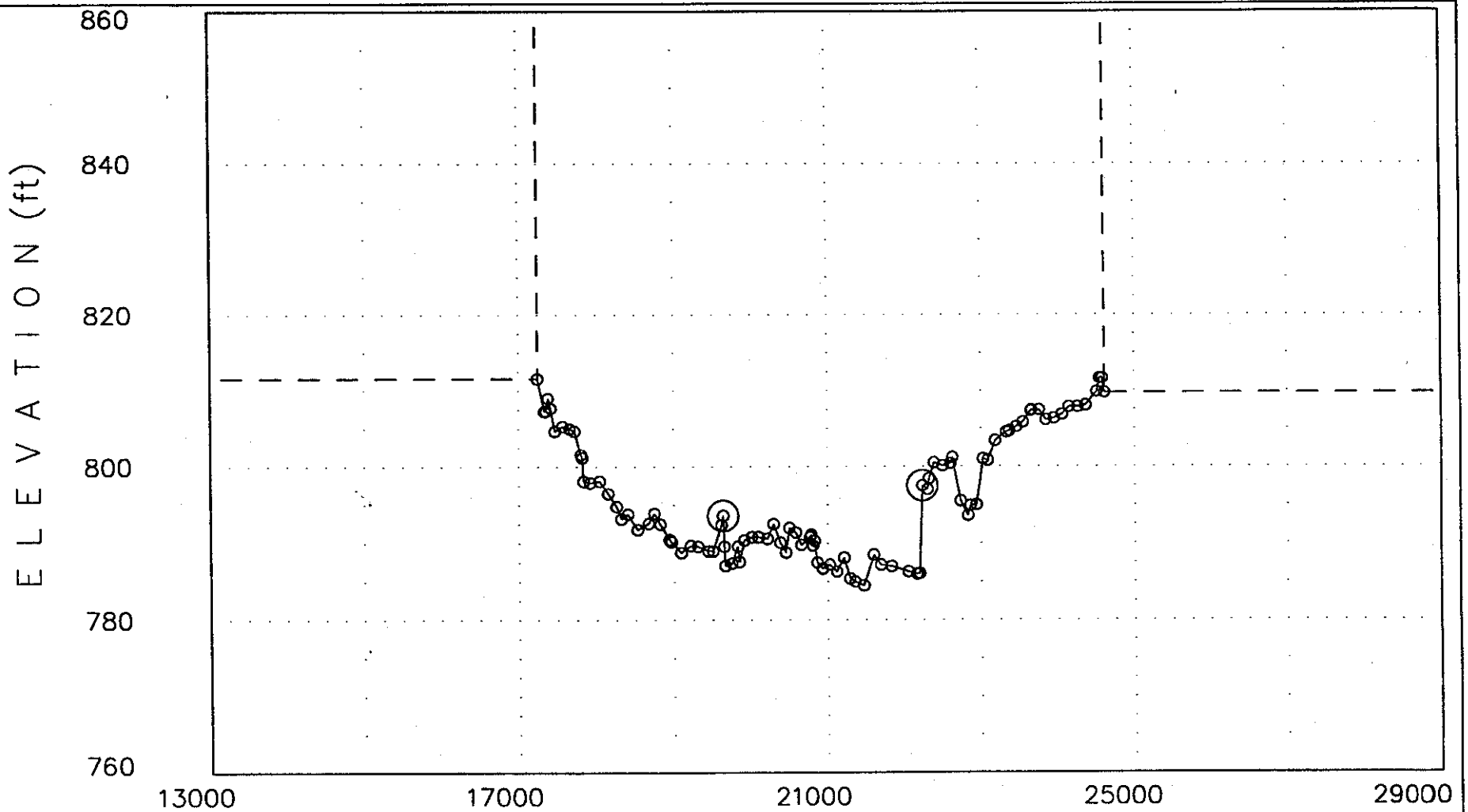
04-20-1994

<<<<<< Cross Section: 124: (FN = 2FCD100.DAT) >>>>>>



04-12-1994

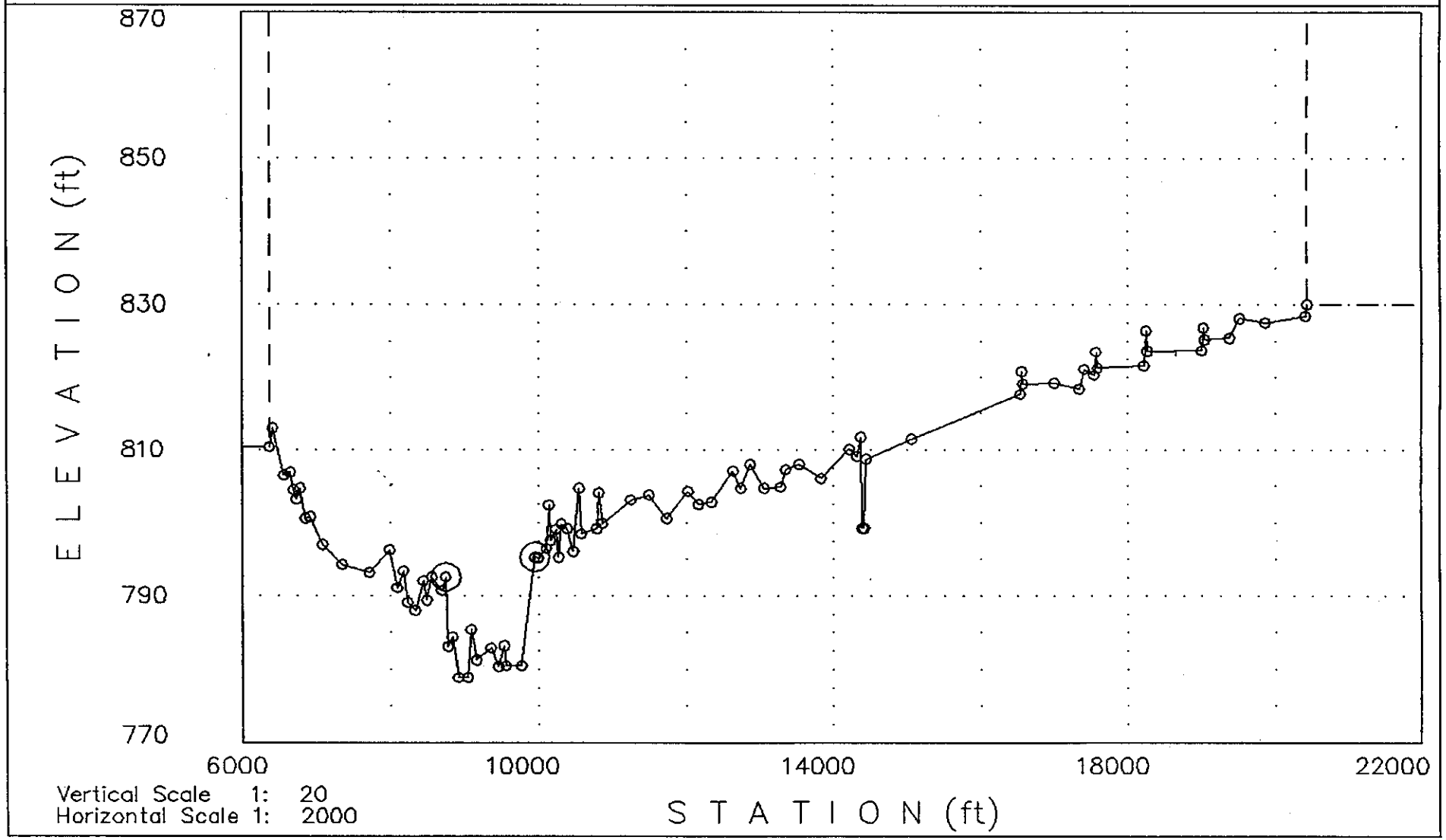
<<<<<< Cross Section: 175.29: (FN = R1IA.DAT) >>>>>>



Vertical Scale 1: 20
Horizontal Scale 1: 2000

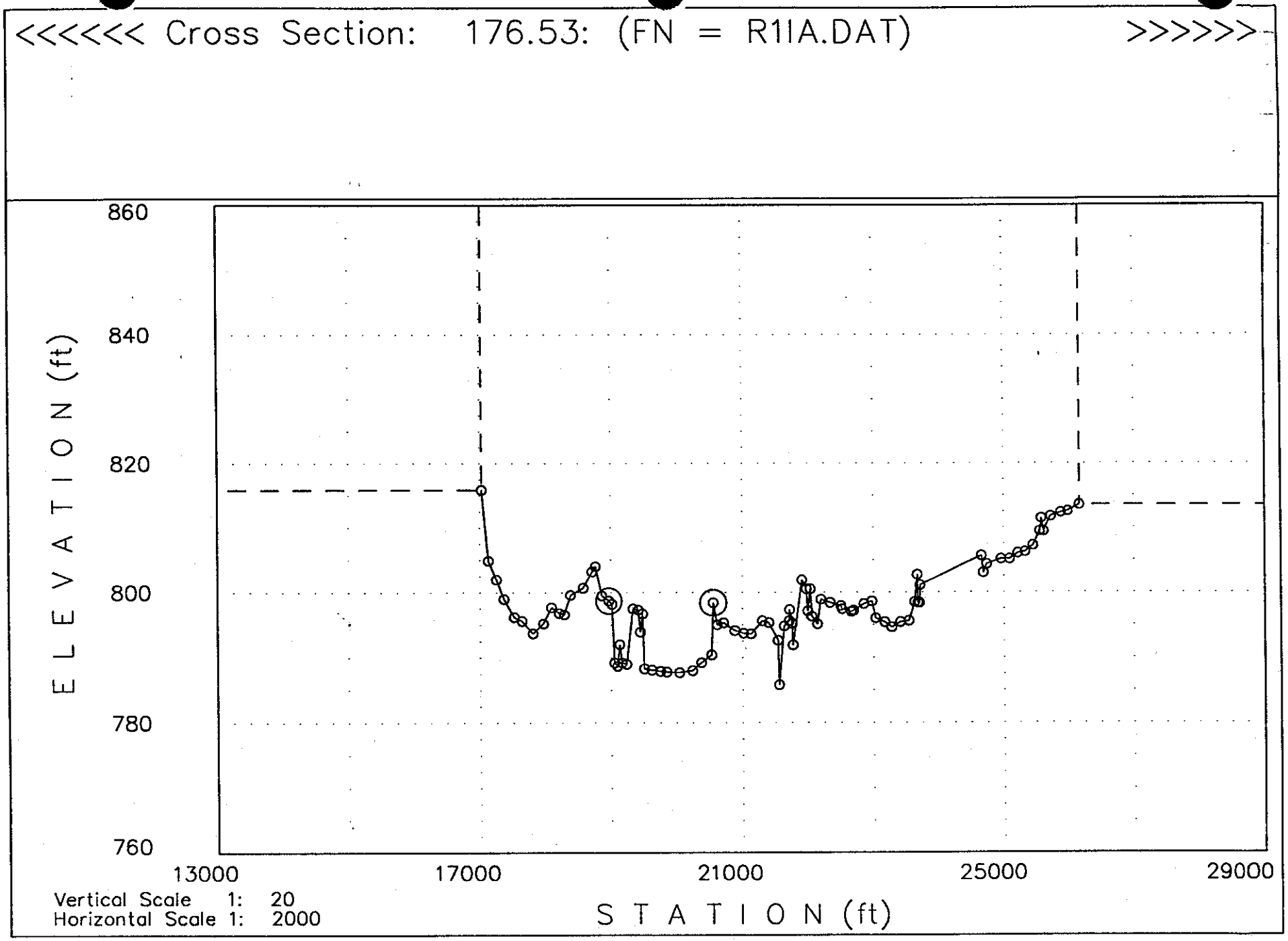
04-20-1994

<<<<<< Cross Section: 144: (FN = 2FCD100.DAT) >>>>>>



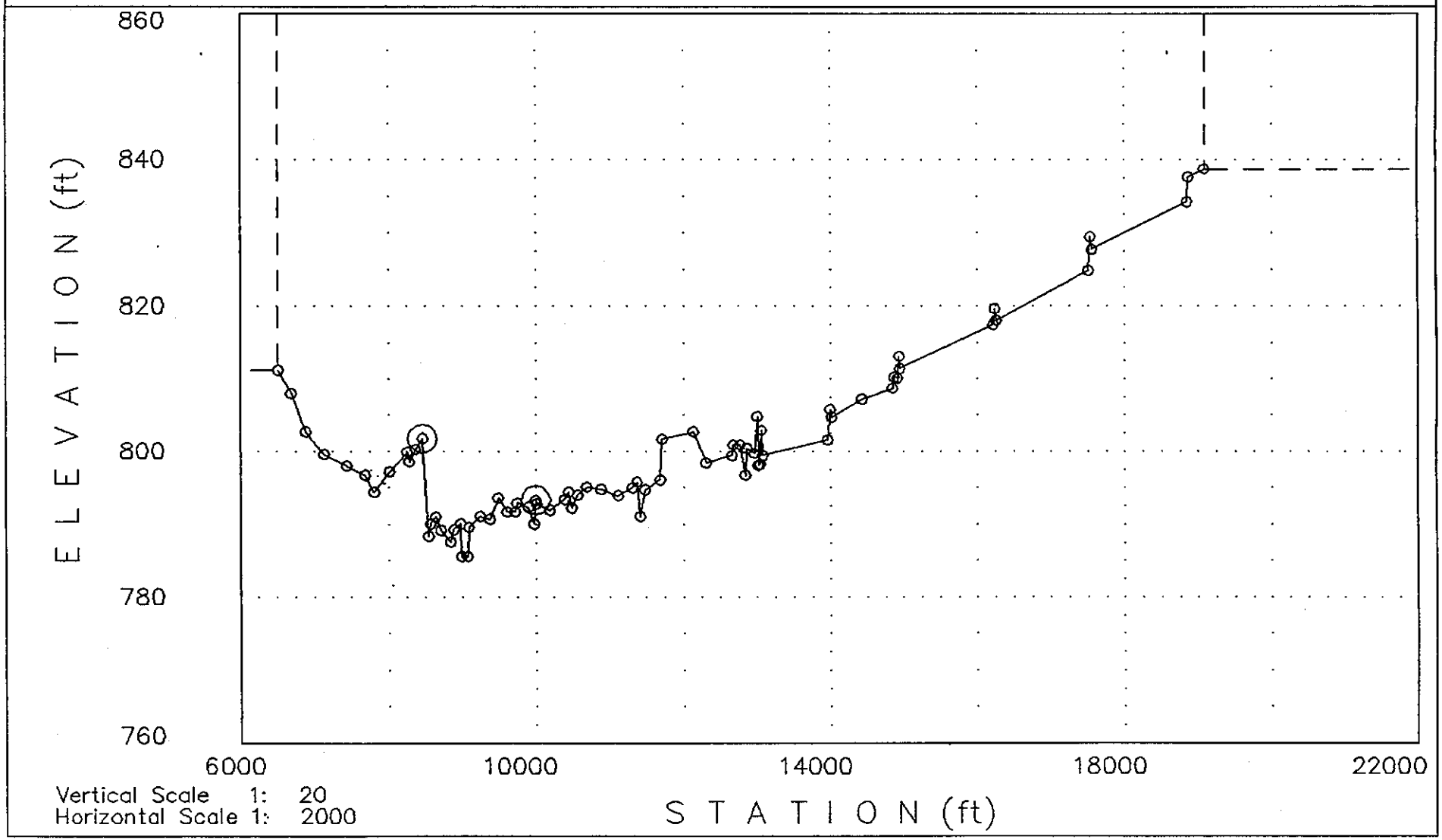
Vertical Scale 1: 20
Horizontal Scale 1: 2000

04-12-1994


<<<<<< Cross Section: 176.53: (FN = R11A.DAT) >>>>>>
ELEVATION (ft)
860
840
820
800
780
760
13000
17000
21000
25000
29000
STATION (ft)
Vertical Scale 1: 20
Horizontal Scale 1: 2000

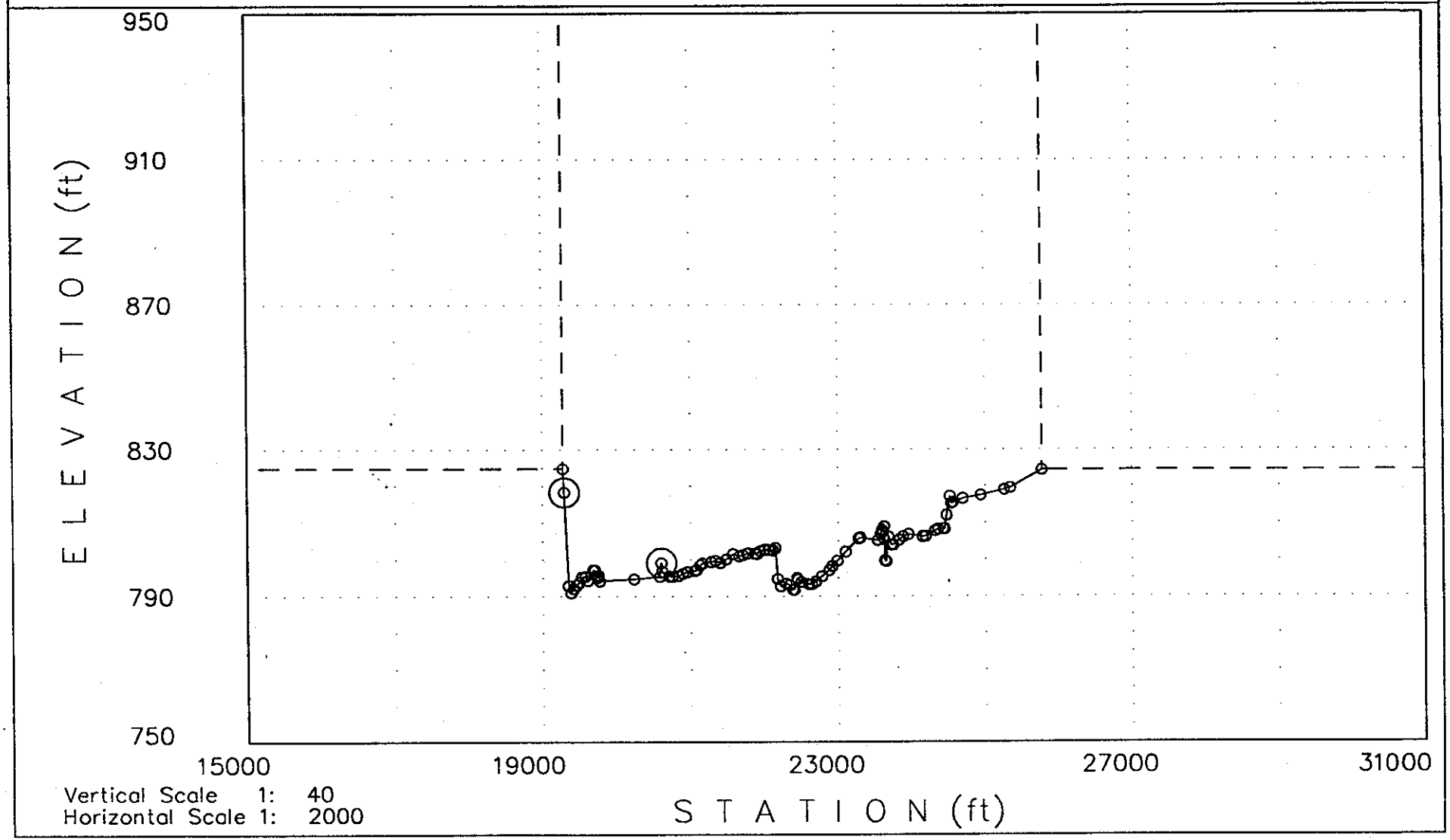
04-20-1994

<<<<<< Cross Section: 160: (FN = 2FCD100.DAT) >>>>>>



04-12-1994

<<<<<< Cross Section: 177.55: (FN = R1IA.DAT) >>>>>>



04-20-1994

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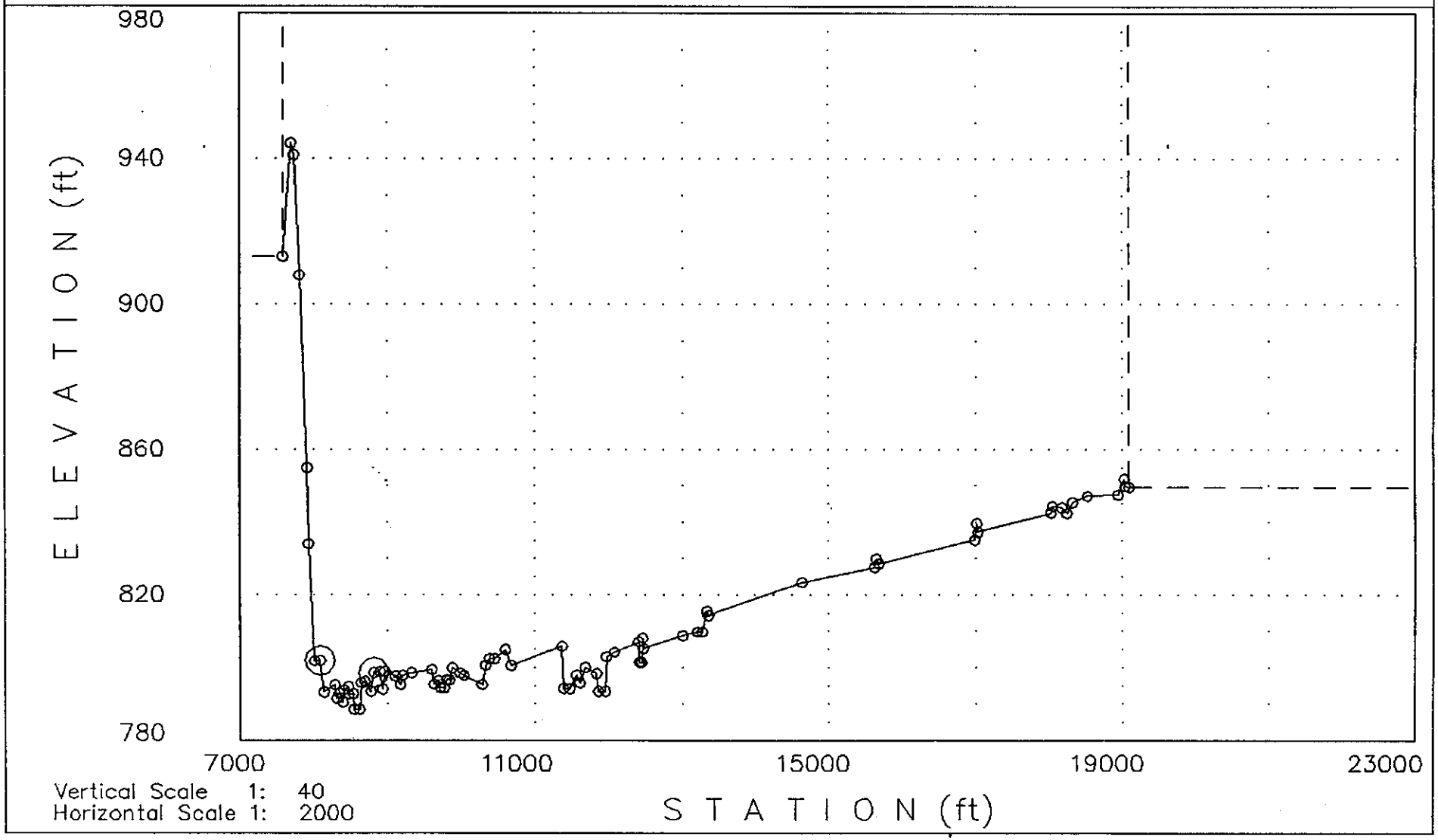
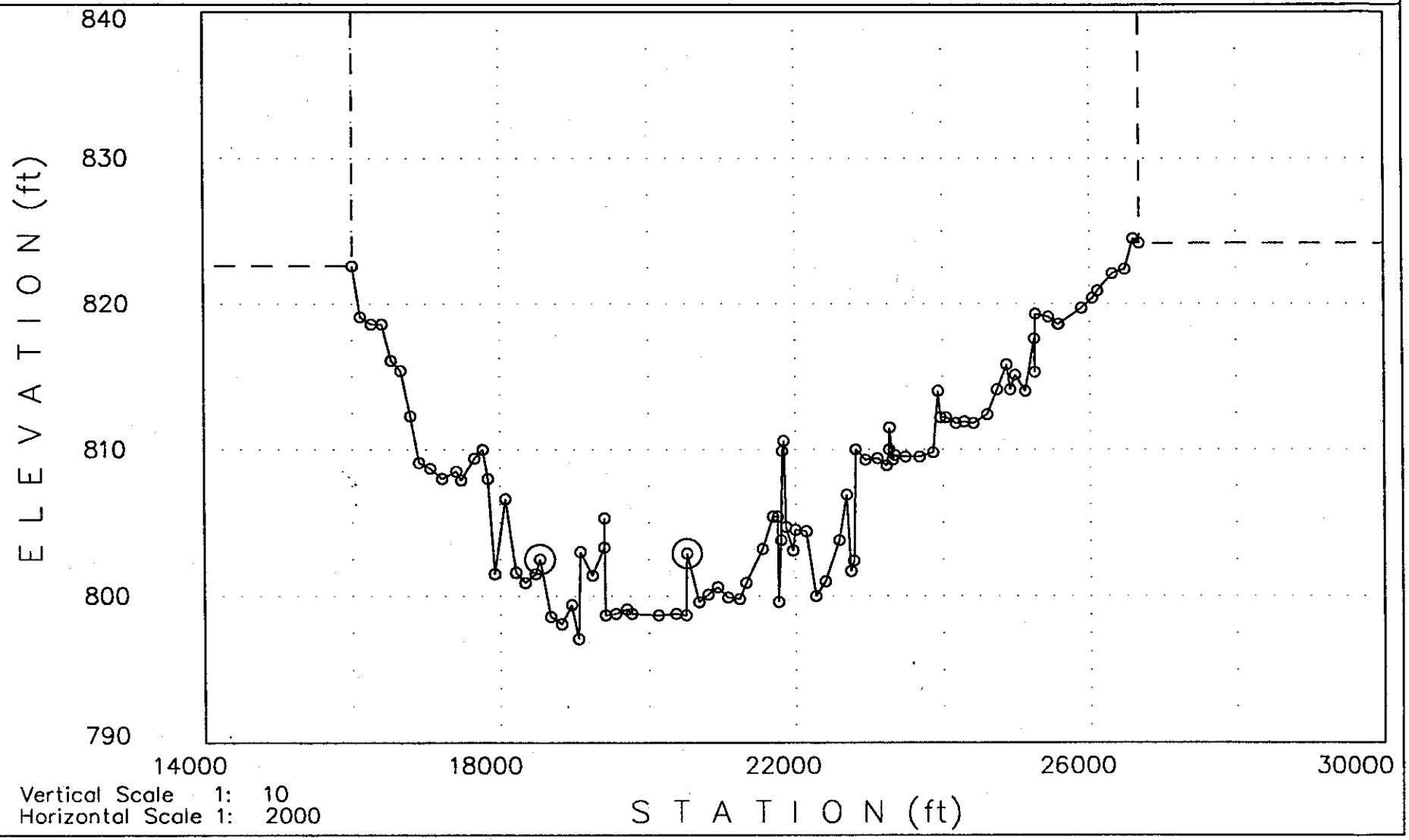


04-12-1994

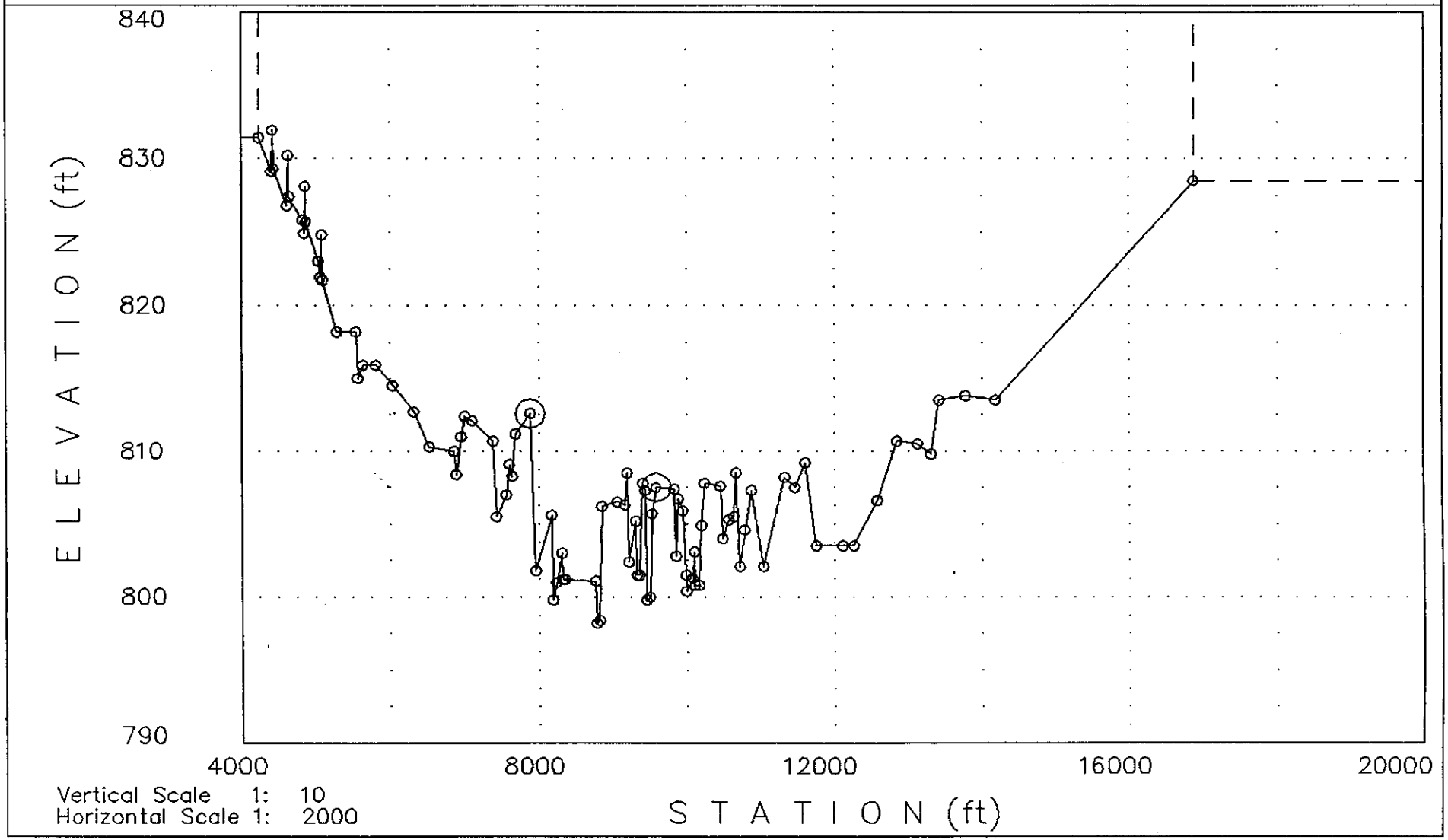
<<<<<< Cross Section: 178.52: (FN = R1IA.DAT) >>>>>>



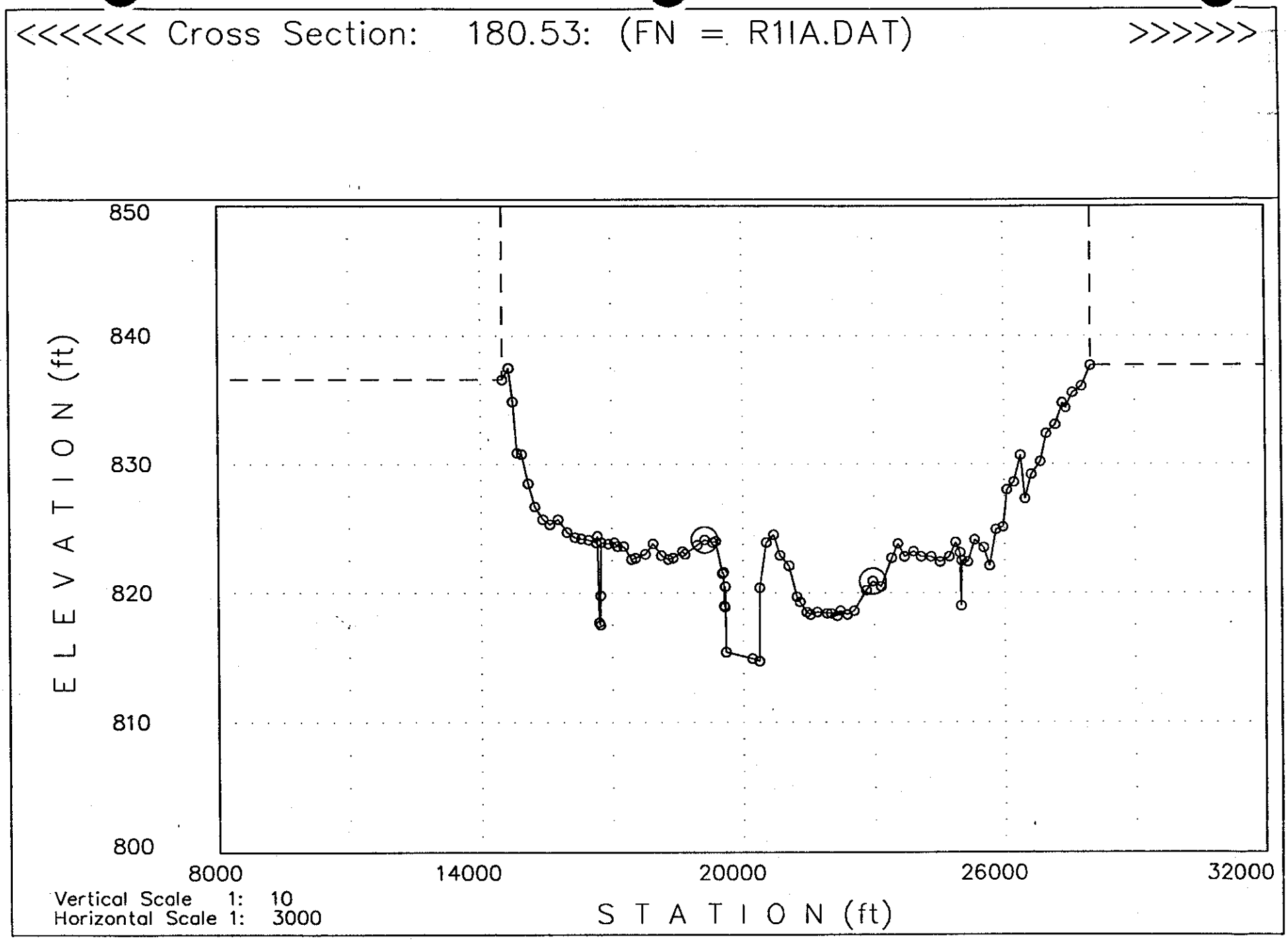
Vertical Scale 1: 10
Horizontal Scale 1: 2000

04-11-1994

<<<<<< Cross Section: 182: (FN = 2FCD100.DAT) >>>>>>

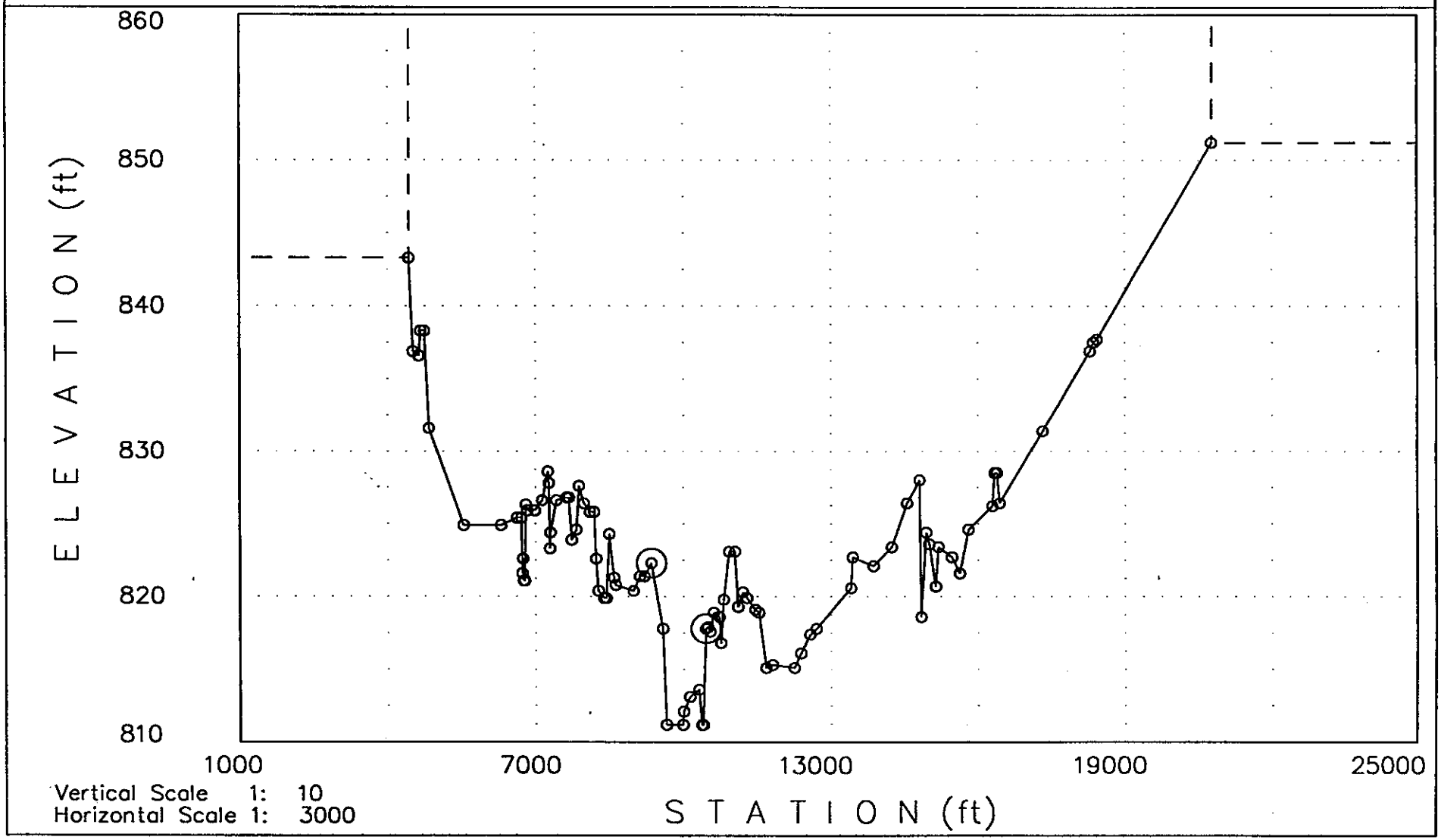


04-12-1994


<<<<<< Cross Section: 180.53: (FN = R1IA.DAT) >>>>>>
850
840
830
820
810
800
ELEVATION (ft)
8000
14000
20000
26000
32000
STATION (ft)
Vertical Scale 1: 10
Horizontal Scale 1: 3000

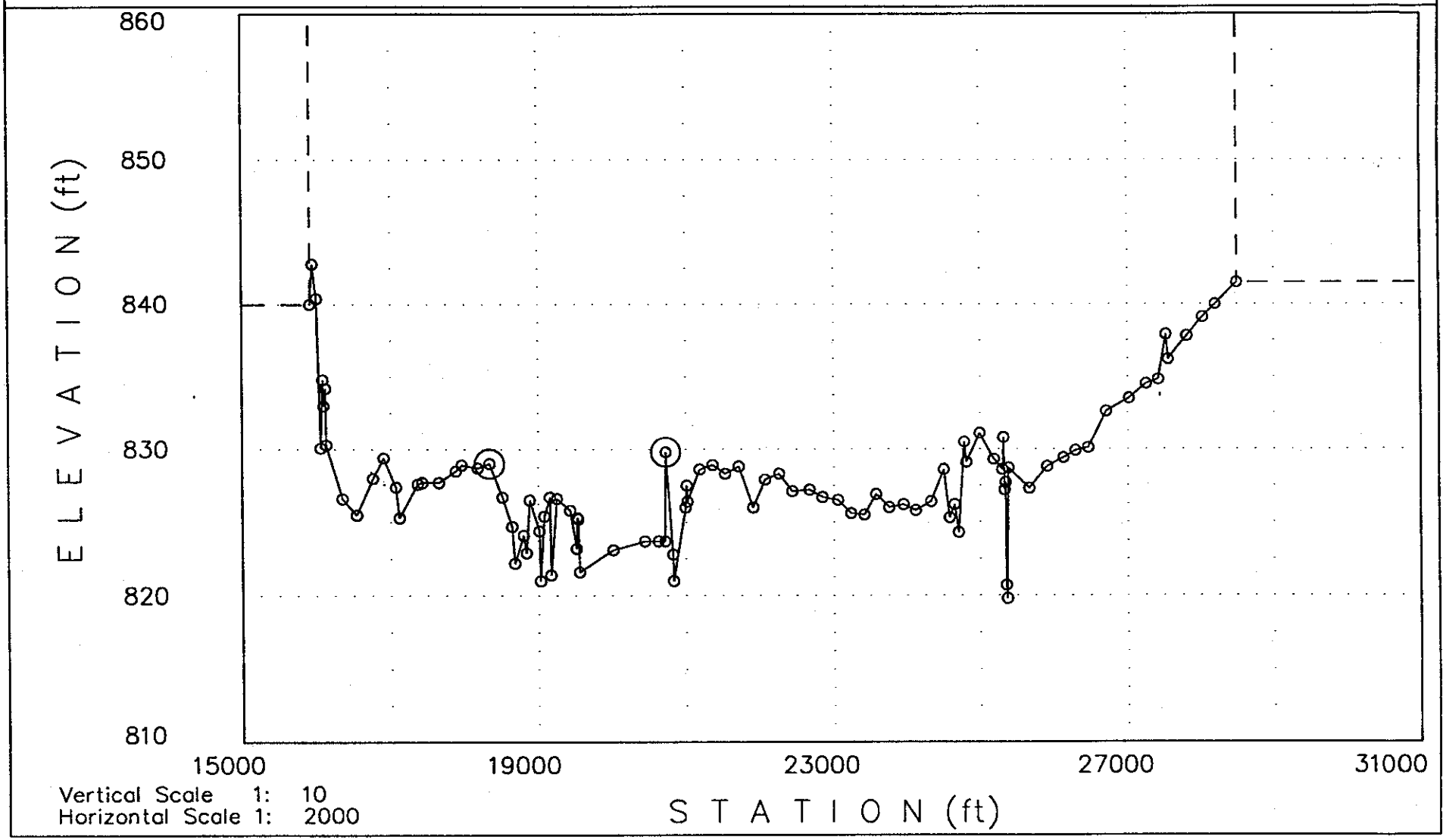
04-21-1994

<<<<<< Cross Section: 204: (FN = 2FCD100.DAT) >>>>>>



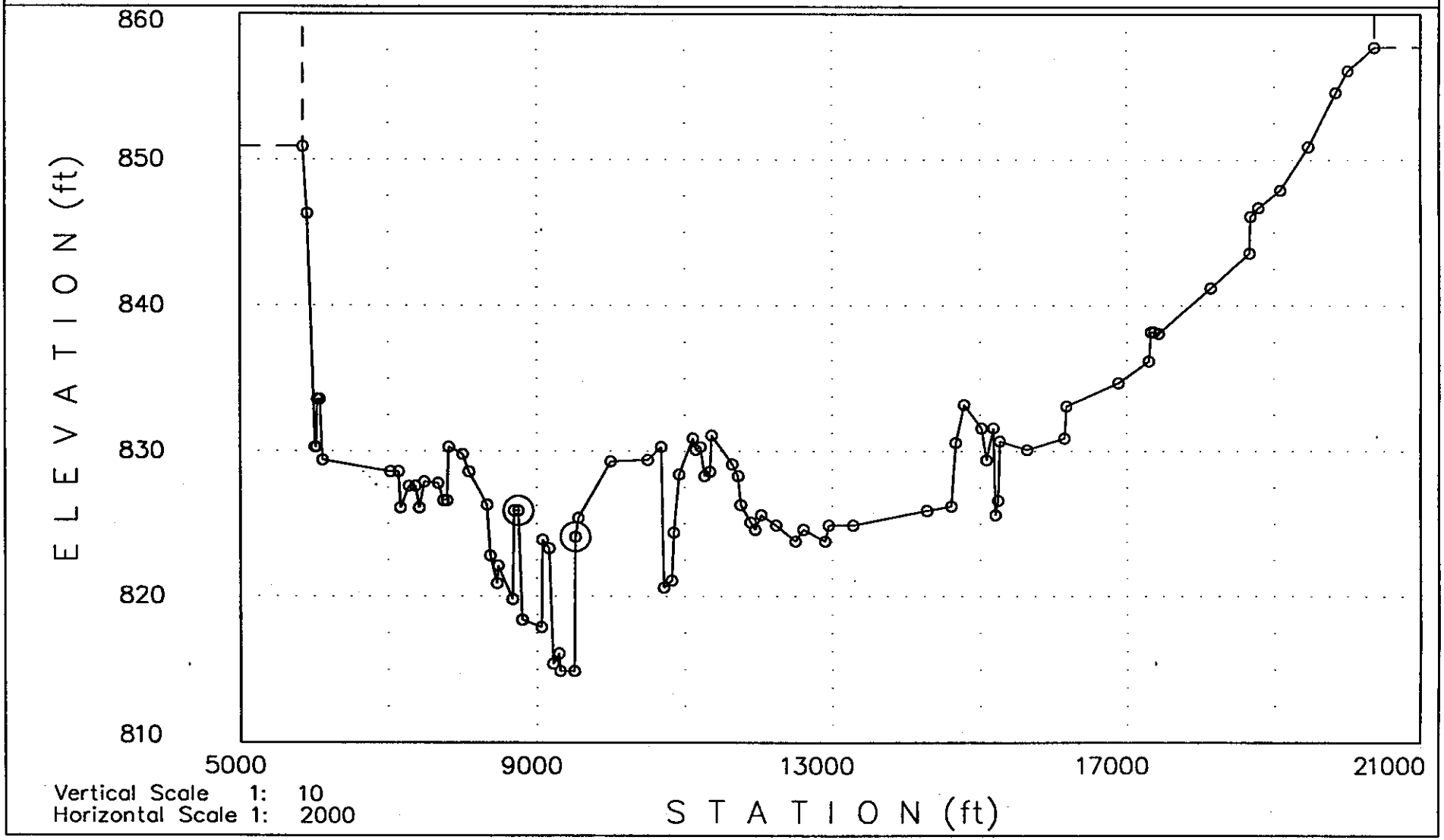
04-21-1994

<<<<<< Cross Section: 181.48: (FN = R1IA.DAT) >>>>>>



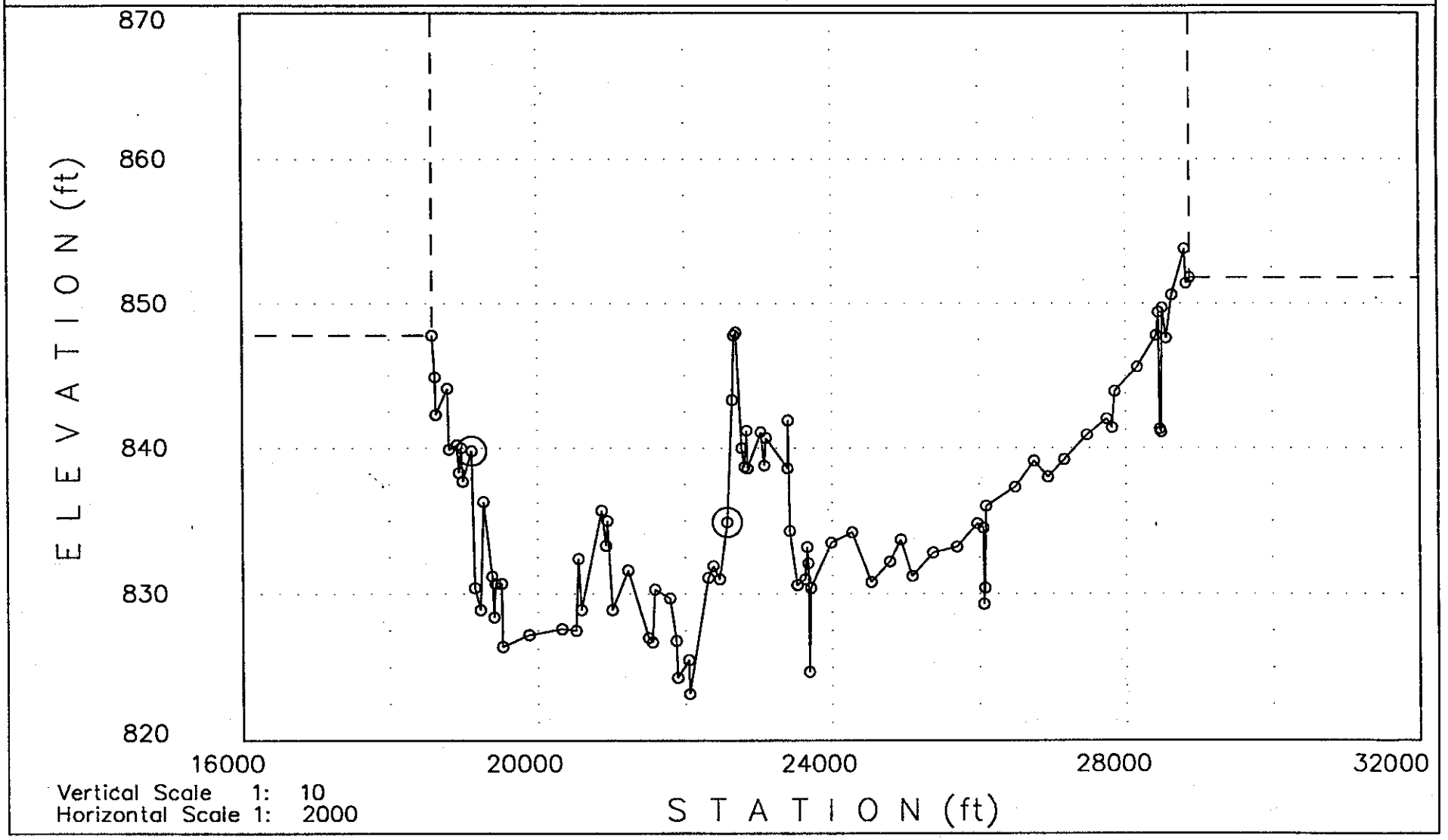
04-11-1994

<<<<<< Cross Section: 218: (FN = 2FCD100.DAT) >>>>>>



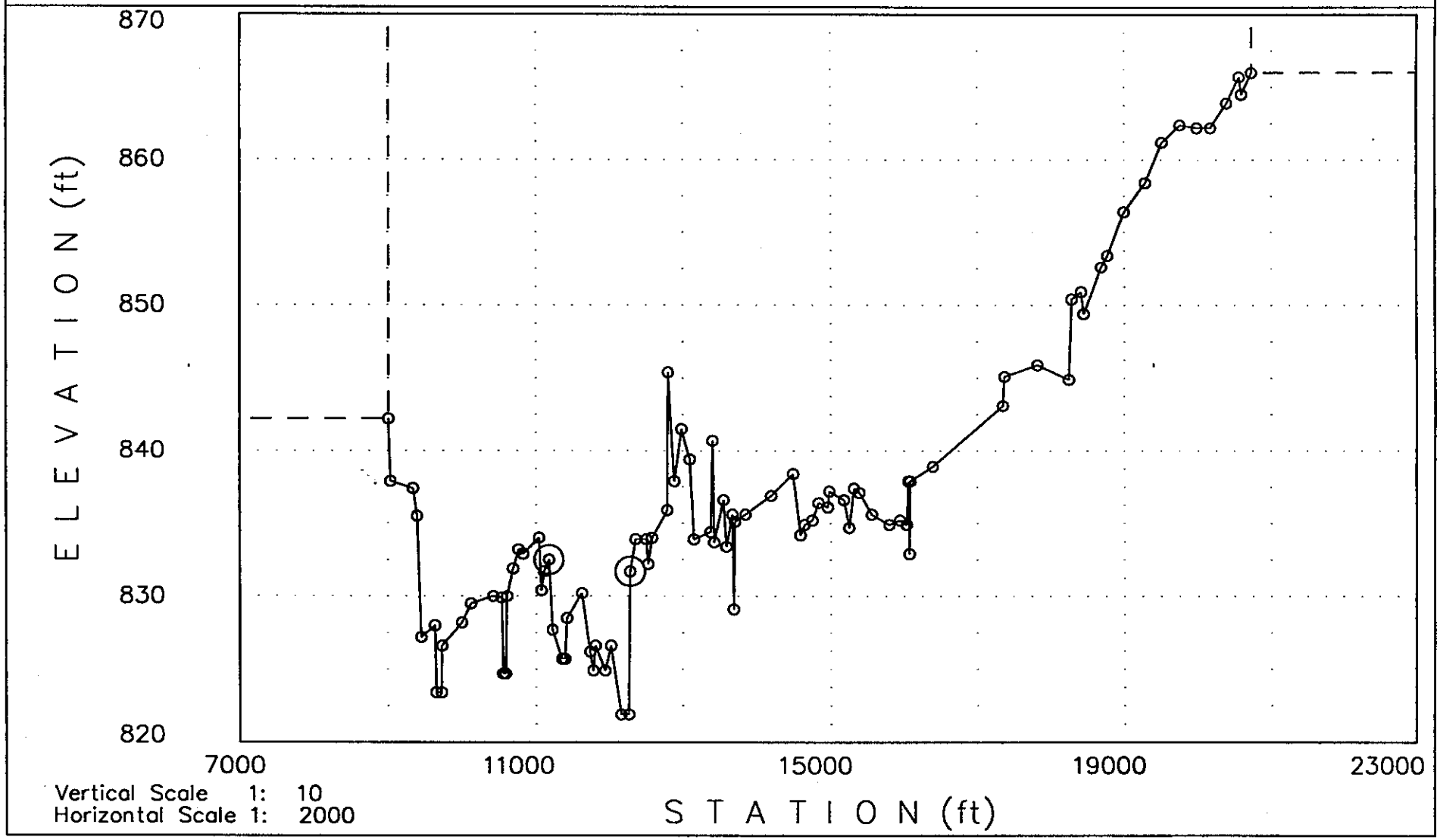
04-21-1994

<<<<<< Cross Section: 182.72: (FN = R1IA.DAT) >>>>>>



04-11-1994

<<<<<< Cross Section: 232: (FN = 2FCD100.DAT) >>>>>>



Vertical Scale 1: 10
Horizontal Scale 1: 2000

04-21-1994

Calibration Analysis -- Cross-Section Comparison

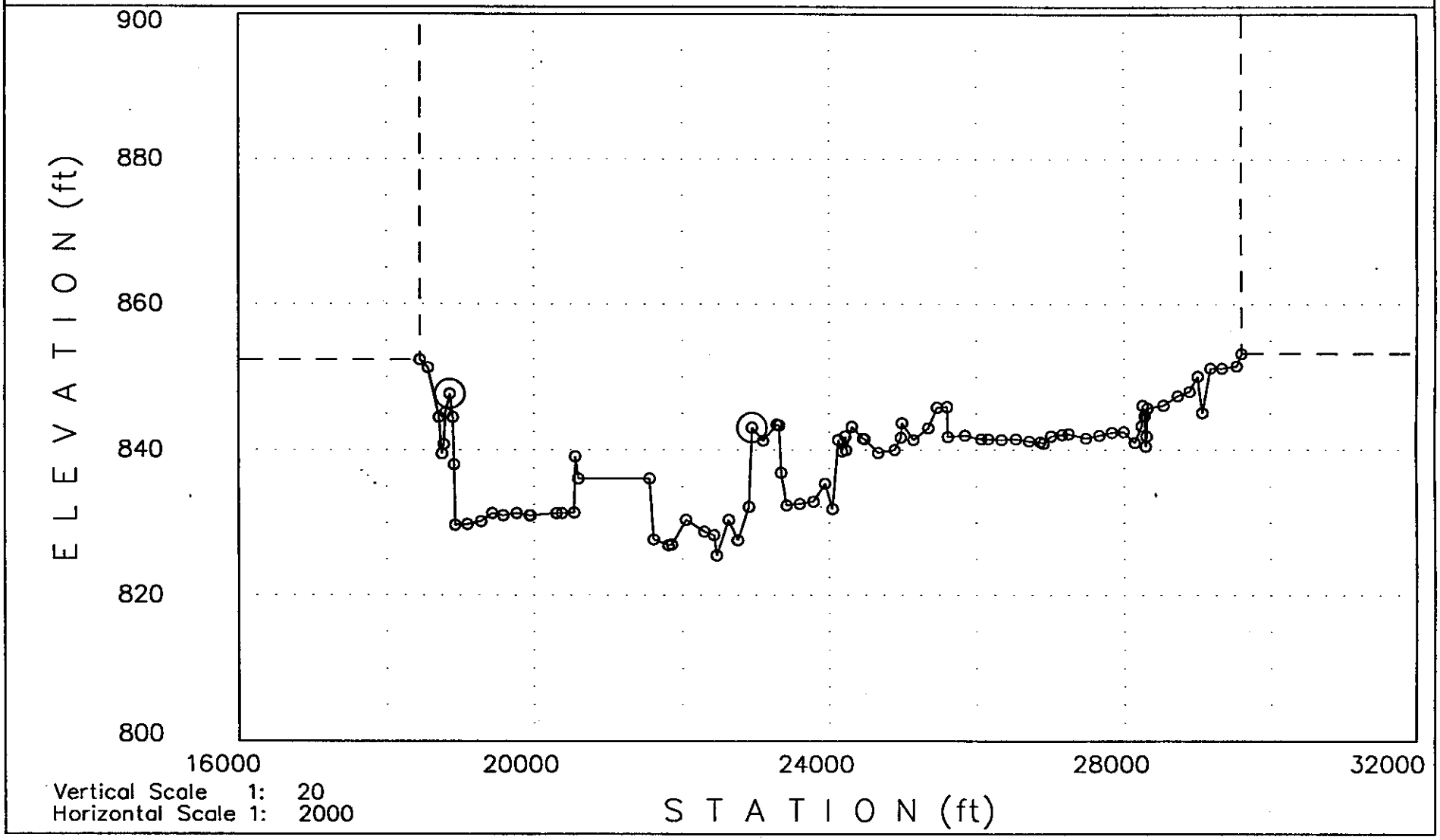
*Note: The first cross-section number listed represents the current river mile stationing. The second cross-section number listed represents the previous FIS stationing.

REACH 2

Cross - Section	Approx. Location	Previous Contractor	Date of Aerial Flight/Map Co.	X-Sect. Comparison
183.20/244	Apache Rd.	Dames & Moore	1984 Aerial Mapping Co.	Minor changes in channel; sed. build-up in center
184.14/256	Watson Rd.	Dames & Moore	1984 Aerial Mapping Co.	Increase in irregularity in main channel
185.28/268	Rainbow Rd.	Dames & Moore	1984 Aerial Mapping Co.	Inc. in irregularity and alignment in channel geometry
186.10/278	Dean Rd.	Dames & Moore	1984 Aerial Mapping Co.	Less irregularity in channel geometry
187.06/290	Airport Rd.	Dames & Moore	1984 Aerial Mapping Co.	Very little change in geometry
190.15/328	Perryville Rd.	Dames & Moore	1984 Aerial Mapping Co.	Channel has sed. in main channel
197.26/191.54	Dysart Rd.	Dames & Moore	1984 Aerial Mapping Co.	Minor changes in main channel
199.30/0	115th Ave.	Dames & Moore	1984 Aerial Mapping Co.	Dec. in irregularity in main channel

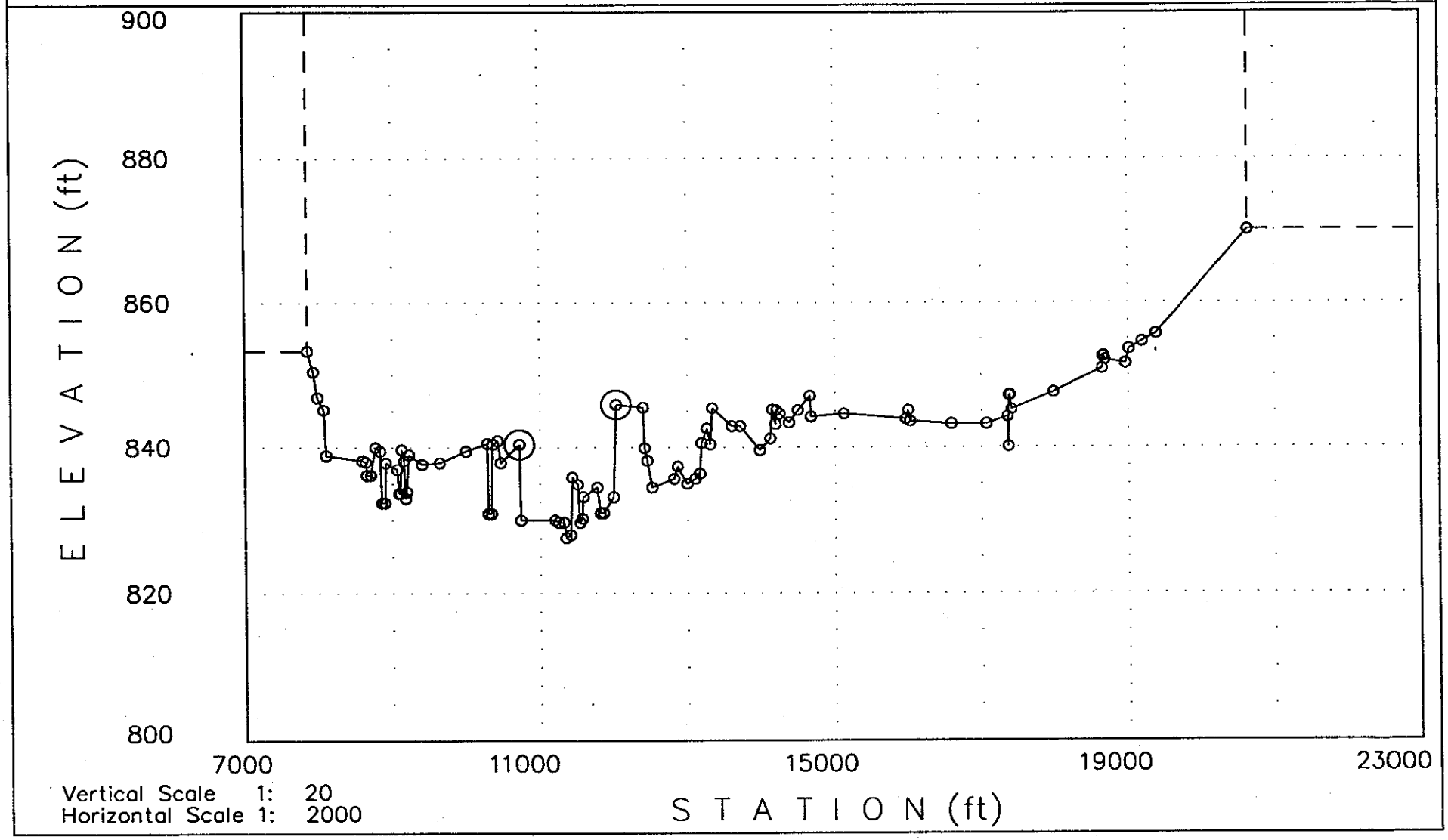
Reach 2 has experienced only minor changes to the channel since the 1980's. These changes are largely from the build-up of sedimentation in the channel and a decrease in irregularity. Some relatively small shifts in main channel alignment have also occurred.

<<<<<< Cross Section: 183.76: (FN = R2IA.DAT) >>>>>>



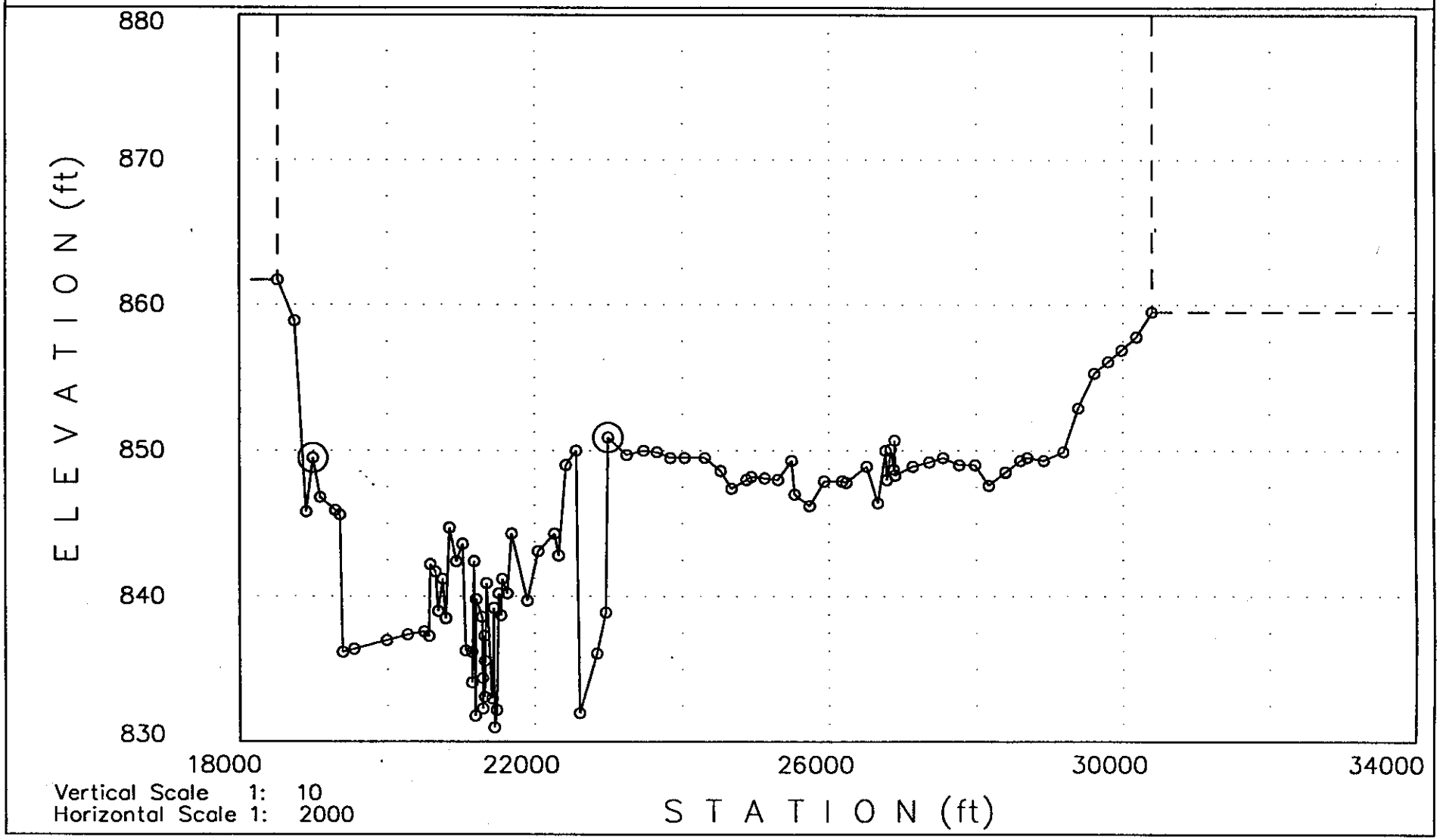
04-21-1994

<<<<<< Cross Section: 244: (FN = 2FCD100.DAT) >>>>>>



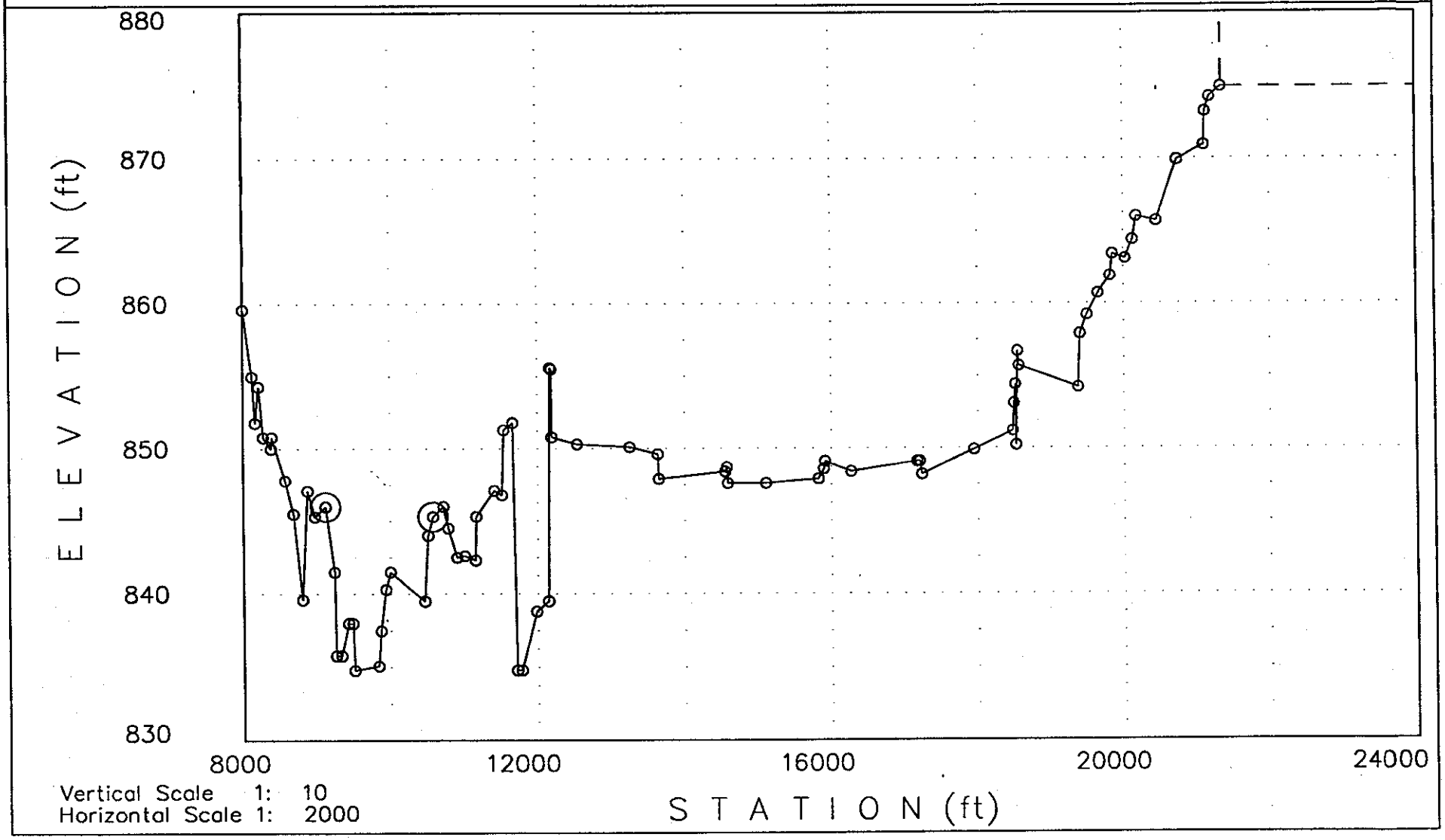
04-21-1994

<<<<<< Cross Section: 184.71: (FN = R2IA.DAT) >>>>>>



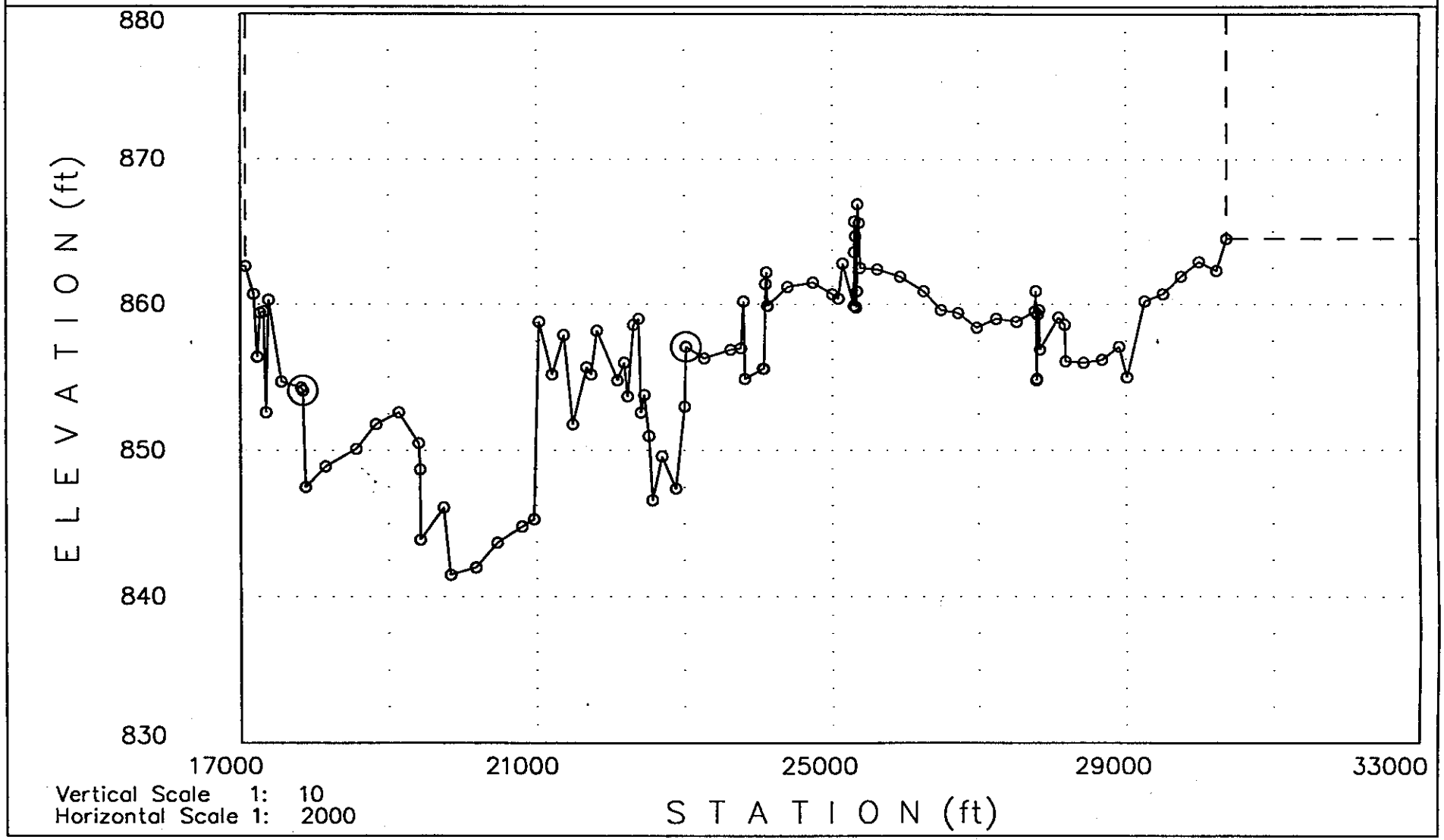
04-12-1994

<<<<<< Cross Section: 256: (FN = 2FCD100.DAT) >>>>>>



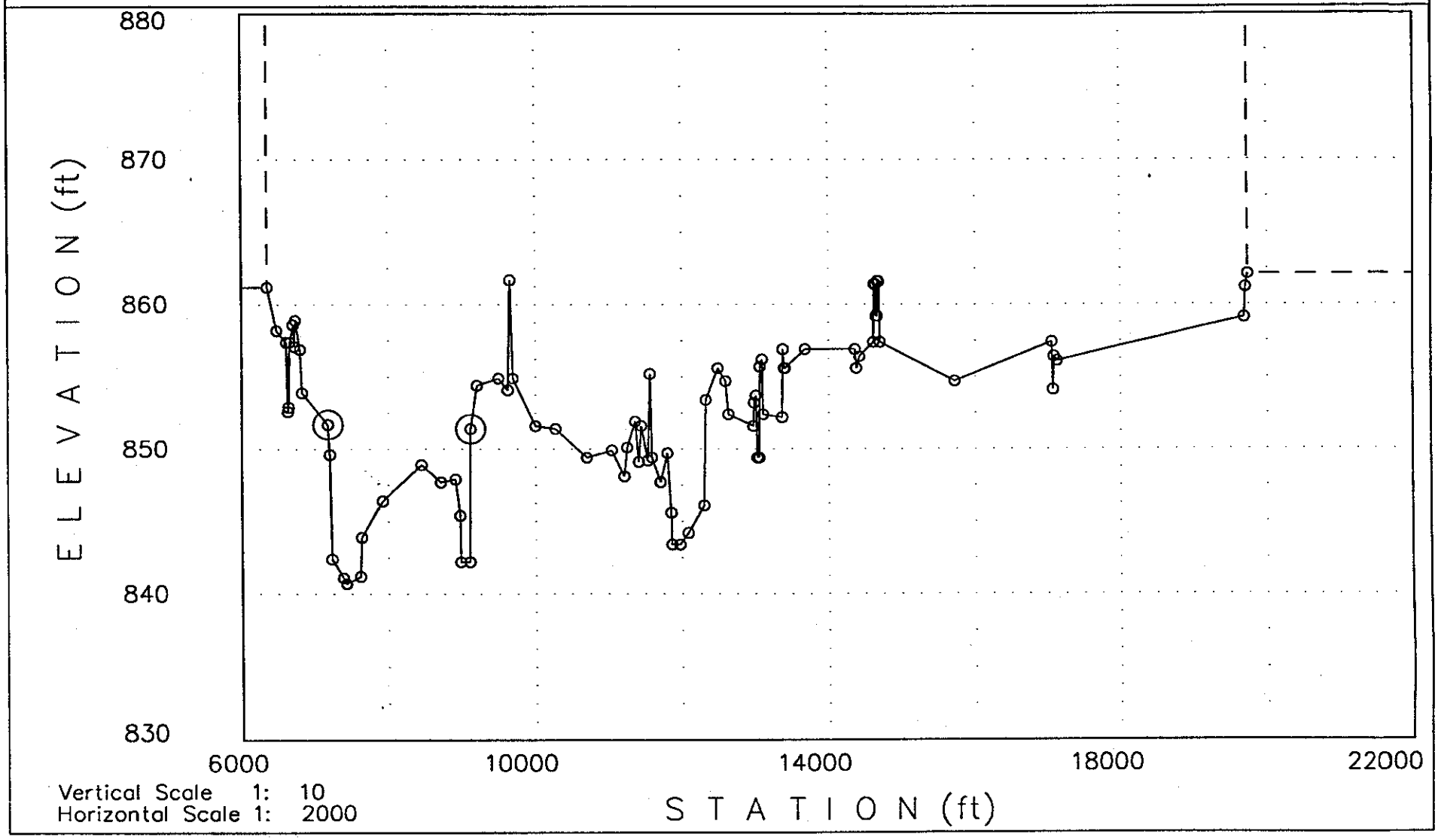
04-21-1994

<<<<<< Cross Section: 185.85: (FN = R2IA.DAT) >>>>>>



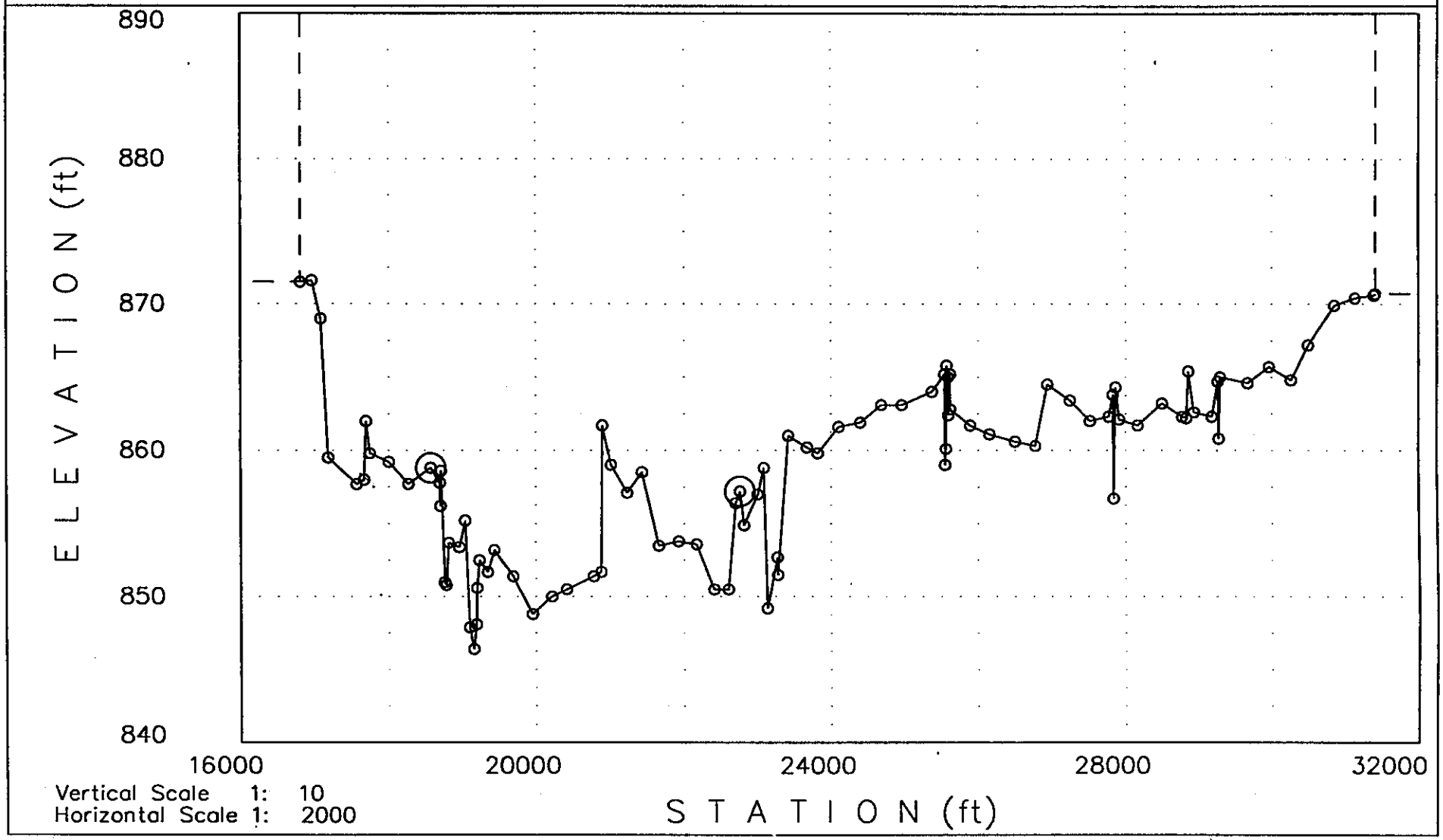
04-12-1994

<<<<<< Cross Section: 268: (FN = 2FCD100.DAT) >>>>>>



04-21-1994

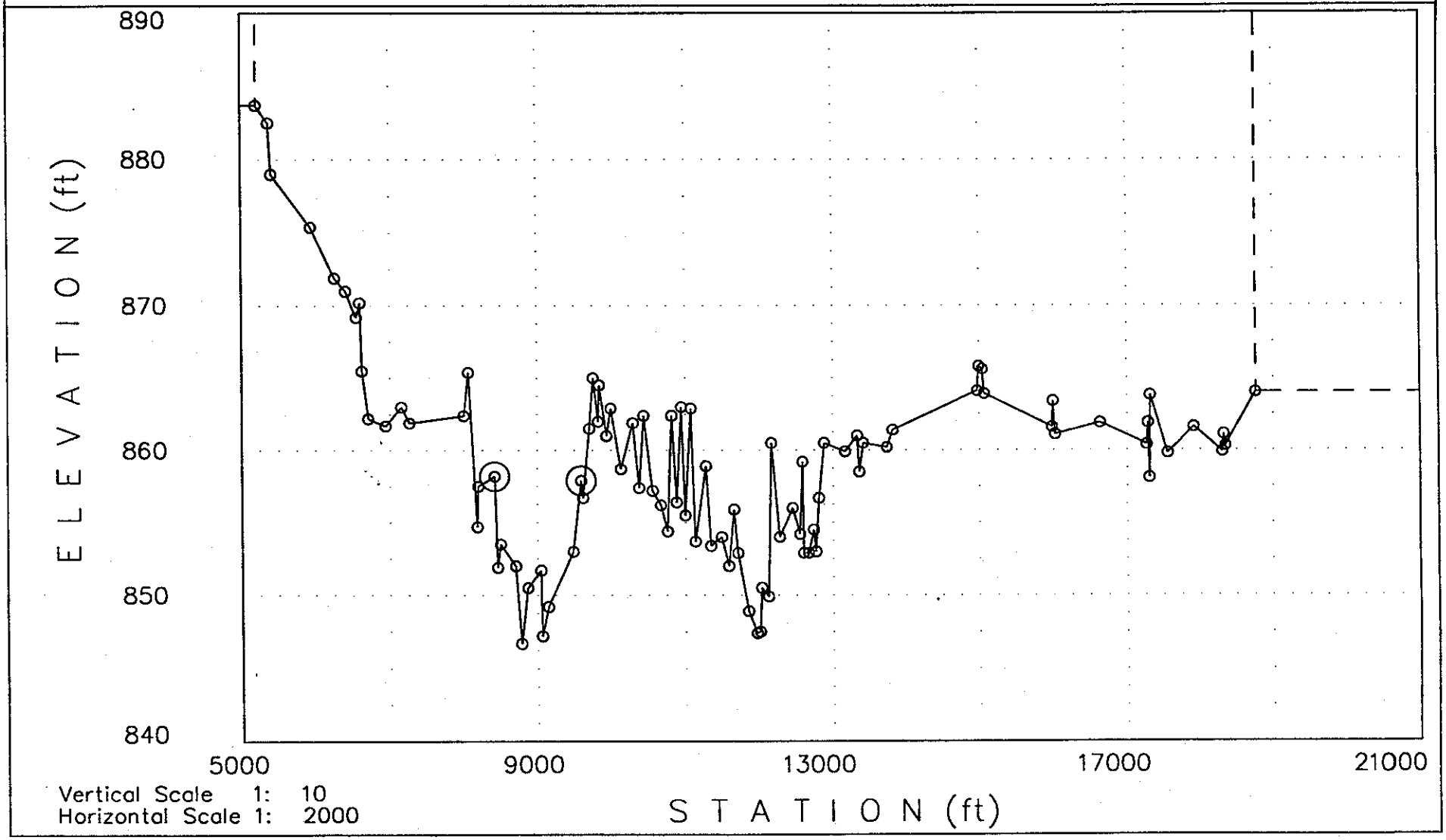
<<<<<< Cross Section: 186.68: (FN = R2IA.DAT) >>>>>>



Vertical Scale 1: 10
Horizontal Scale 1: 2000

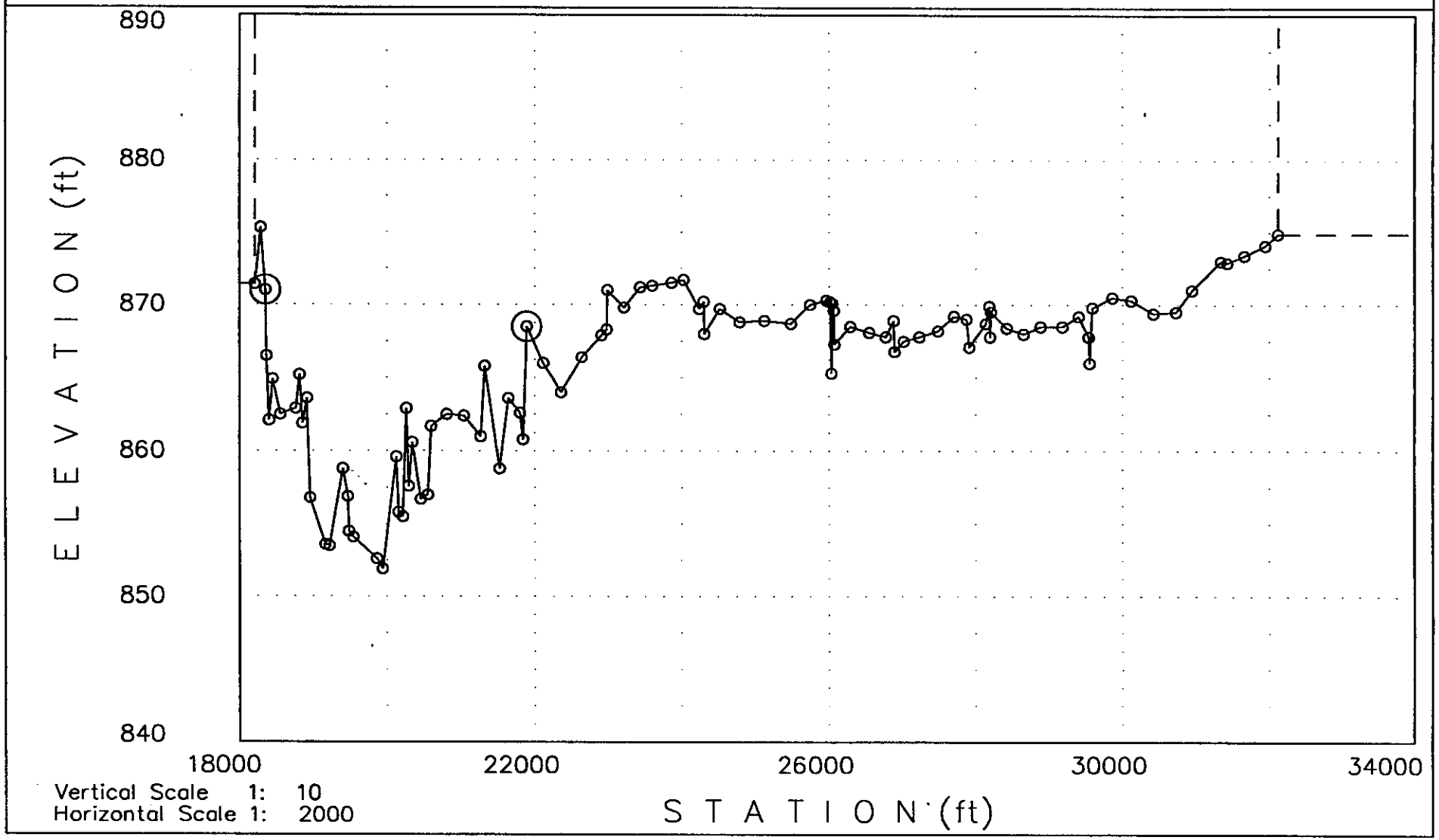
04-12-1994

<<<<<< Cross Section: 278: (FN = 2FCD100.DAT) >>>>>>



04-21-1994

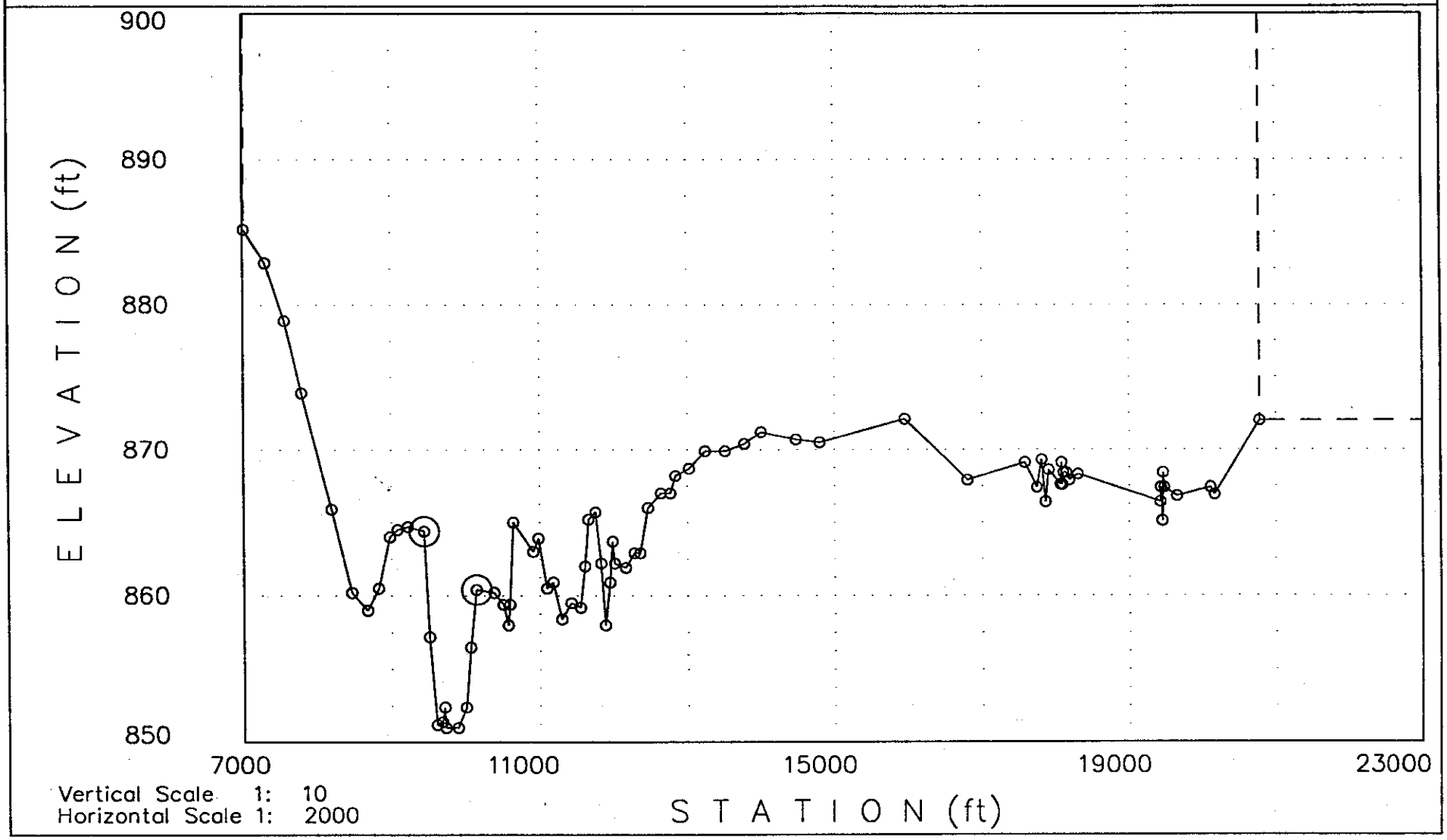
<<<<<< Cross Section: 187.65: (FN = R2IA.DAT) >>>>>>



Vertical Scale 1: 10
Horizontal Scale 1: 2000

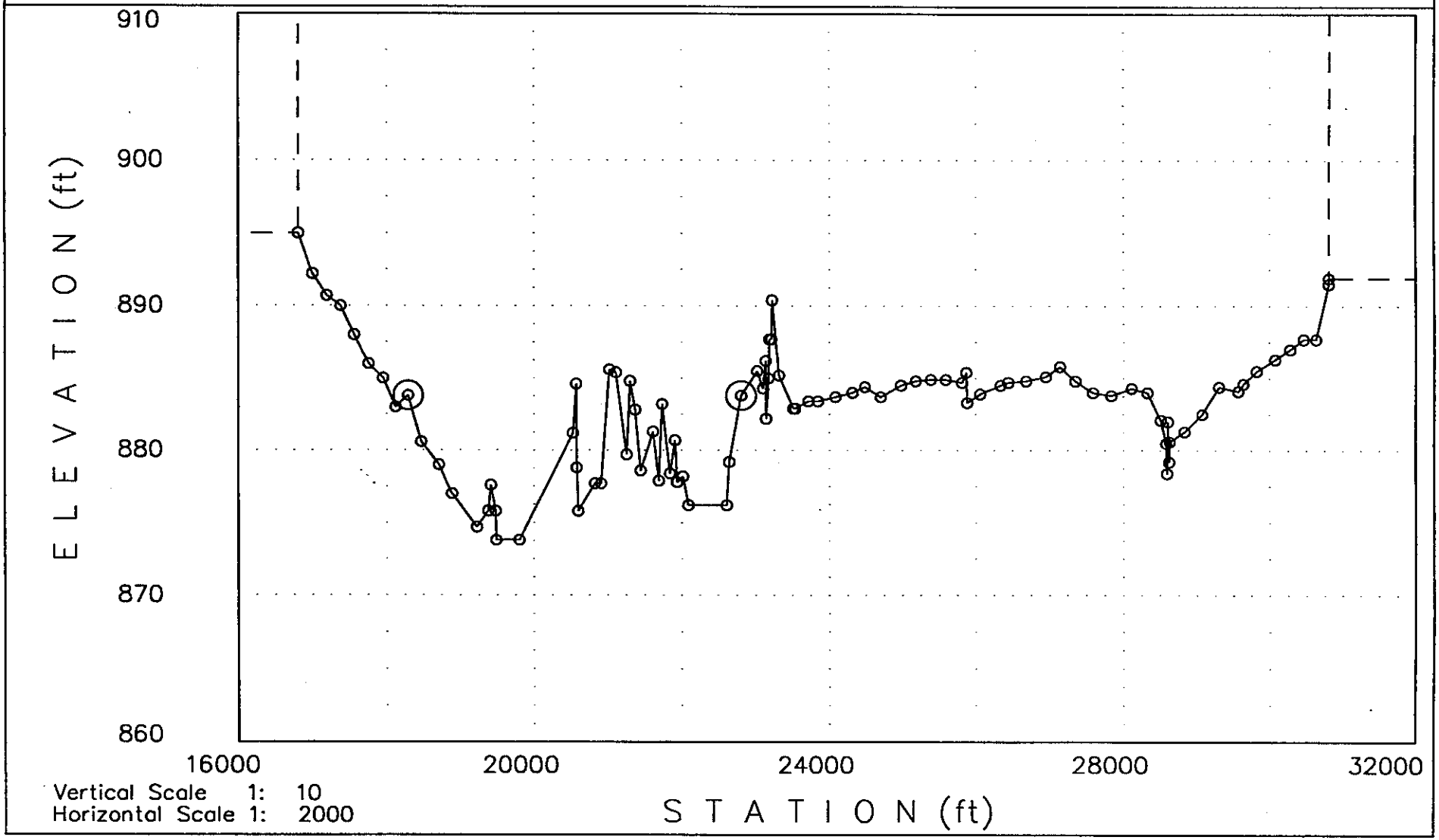
04-12-1994

<<<<<< Cross Section: 290: (FN = 2FCD100.DAT) >>>>>>



04-21-1994

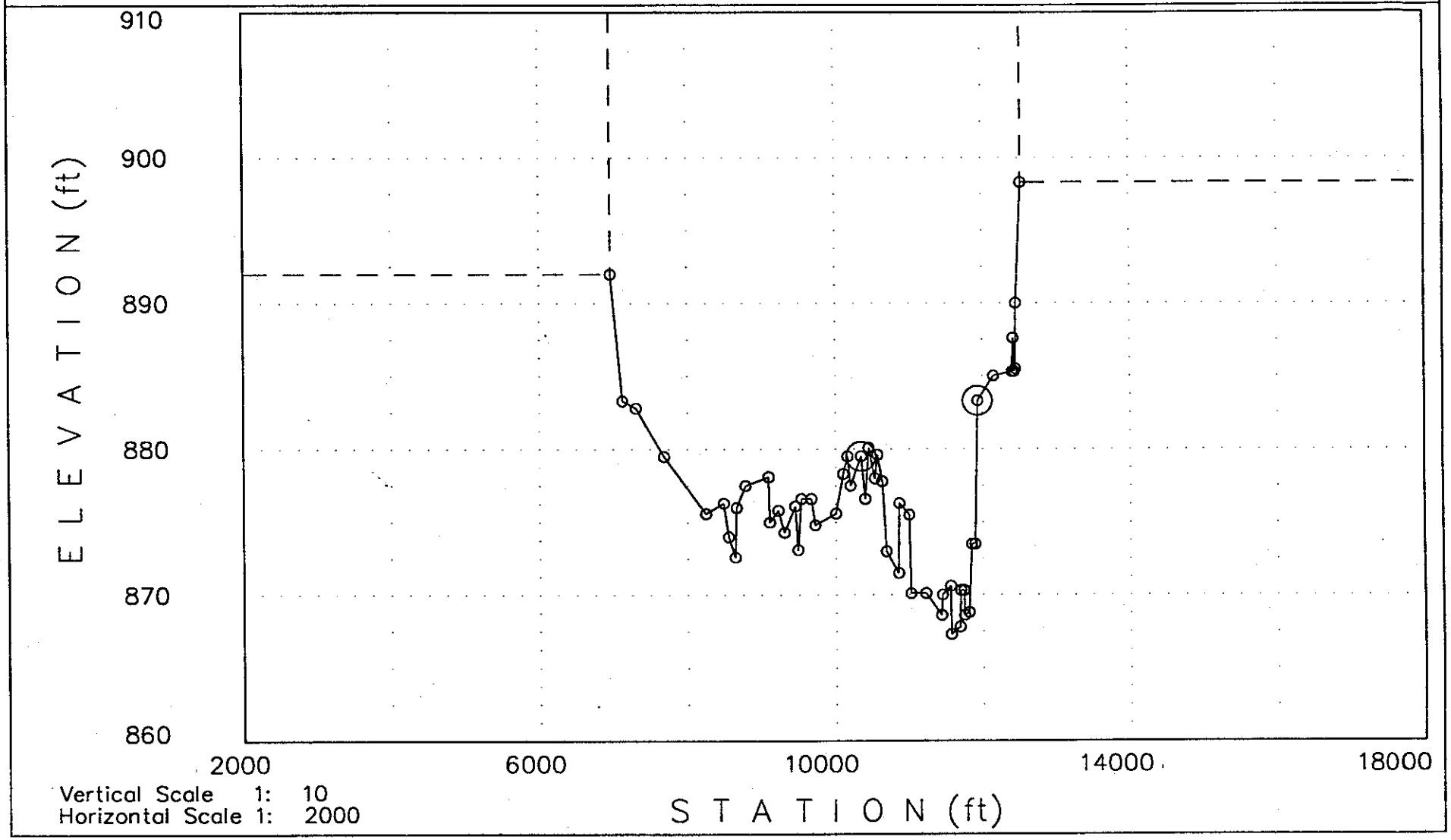
<<<<<< Cross Section: 190.71: (FN = R2IA.DAT) >>>>>>



Vertical Scale 1: 10
Horizontal Scale 1: 2000

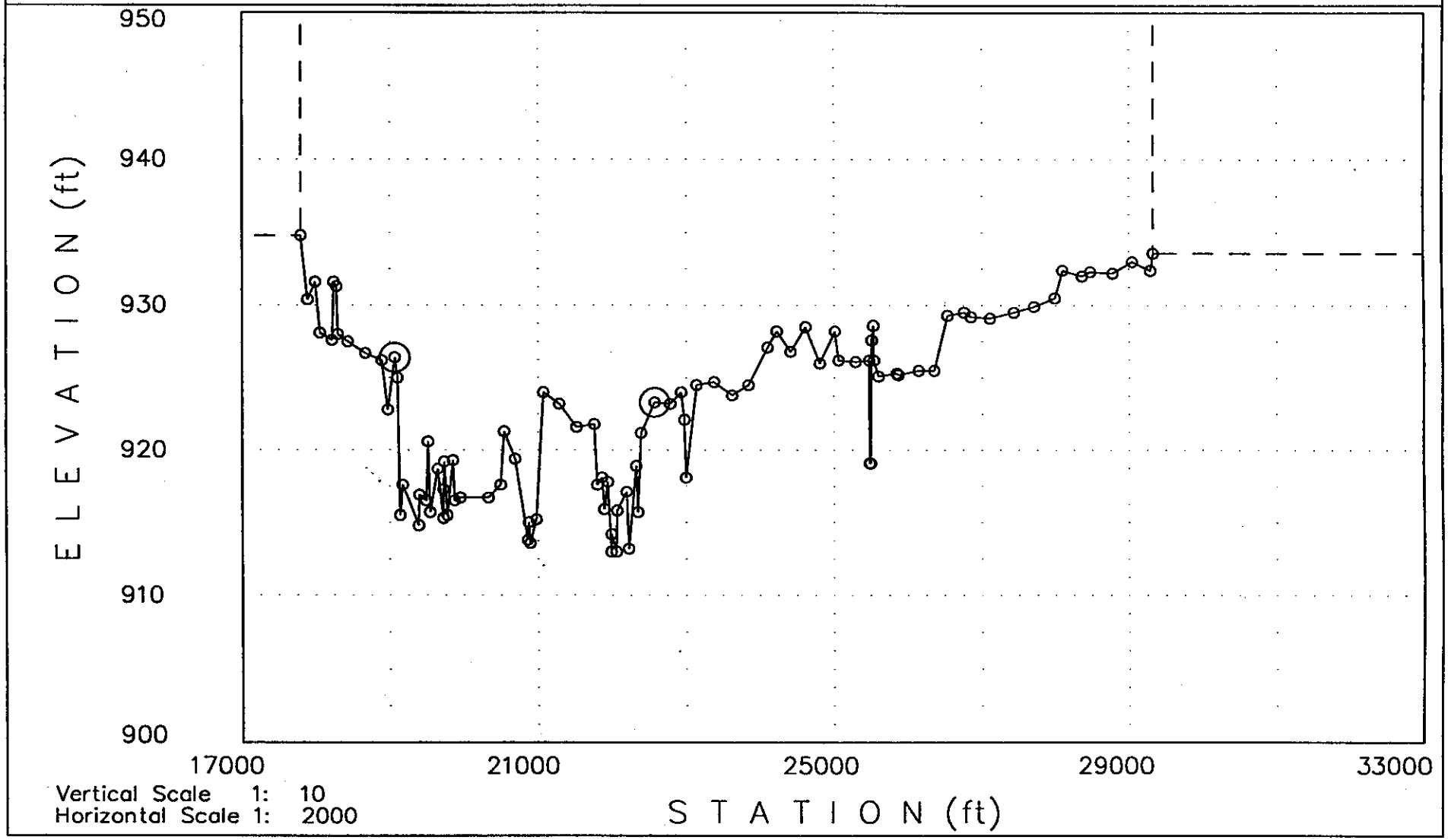
04-12-1994

<<<<<< Cross Section: 328: (FN = 2FCD100.DAT) >>>>>>



04-21-1994

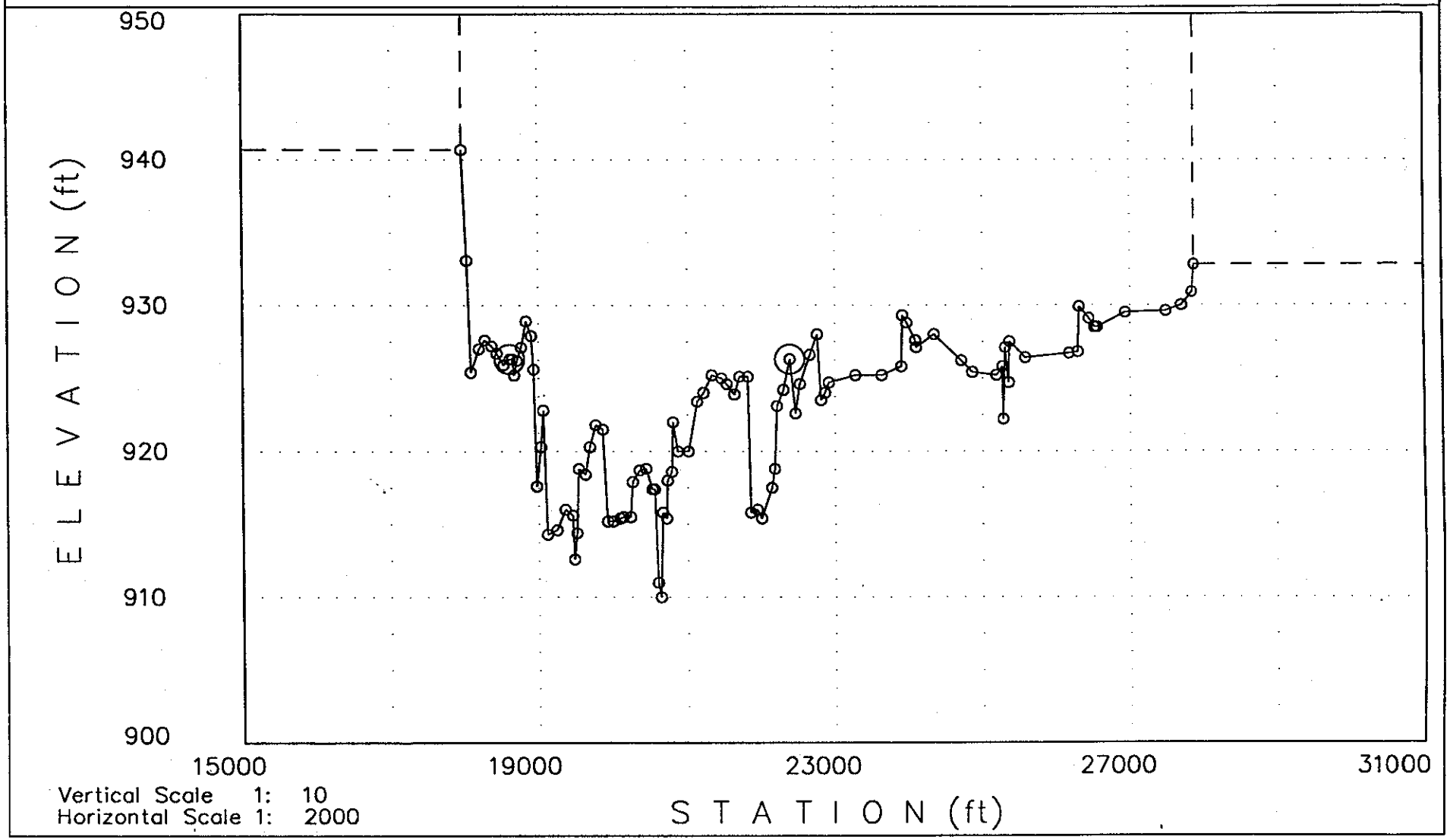
<<<<<< Cross Section: 197.88: (FN = R2IA.DAT) >>>>>>



Vertical Scale 1: 10
Horizontal Scale 1: 2000

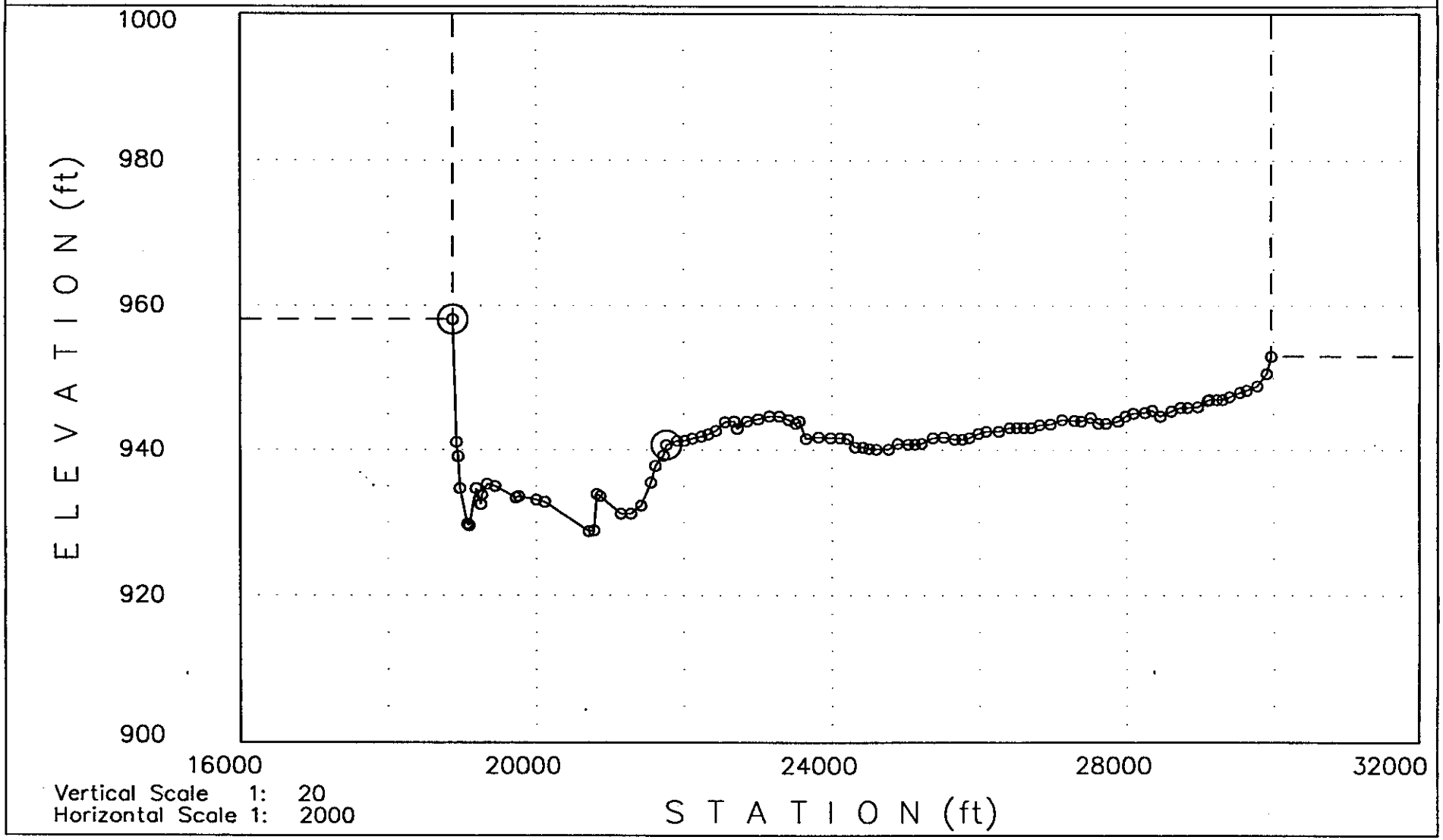
04-12-1994

<<<<<< Cross Section: 191.54: (FN = GILARGRP.I) >>>>>>



04-12-1994

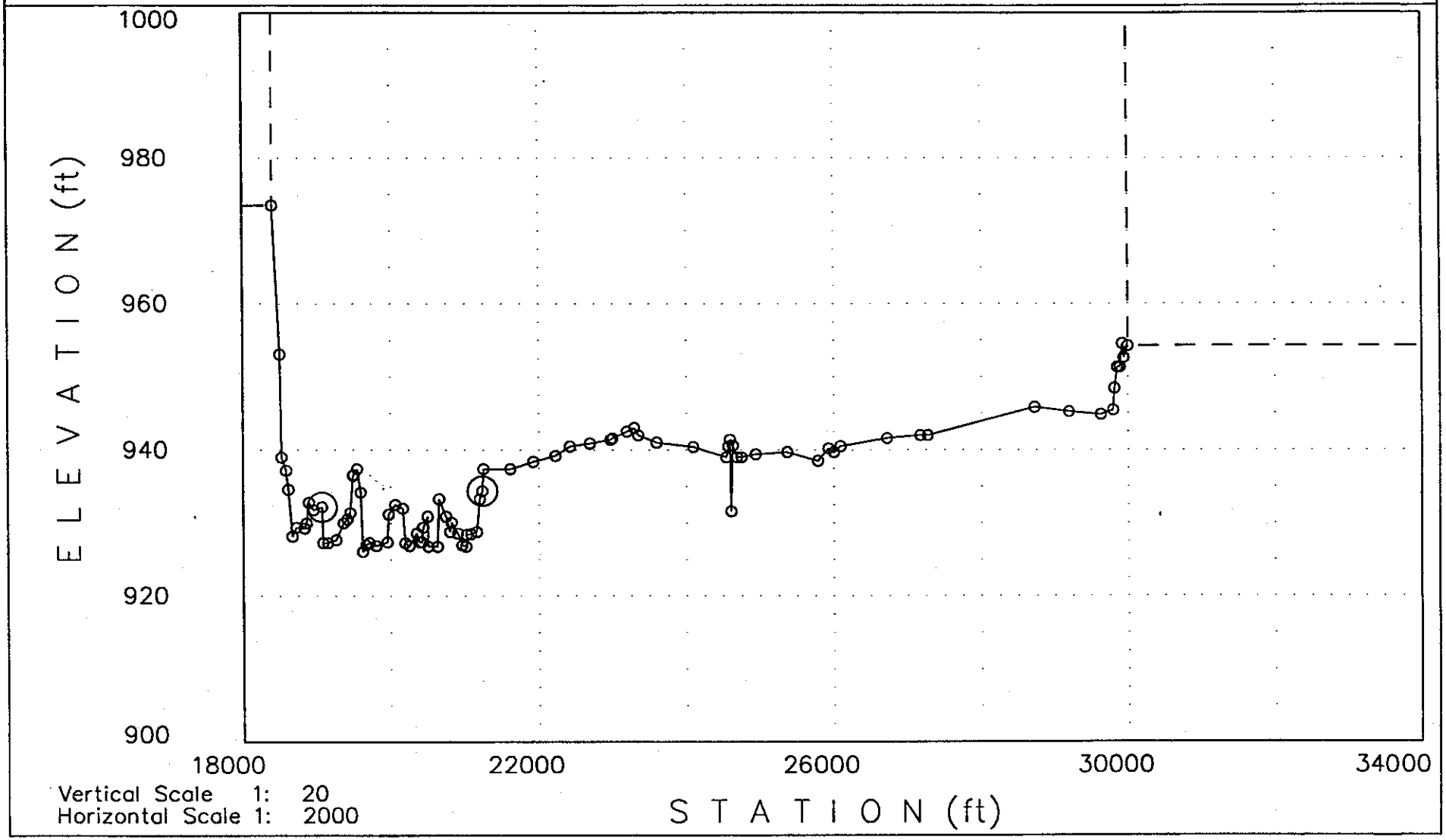
<<<<<< Cross Section: 199.93: (FN = R2IA.DAT) >>>>>>



Vertical Scale 1: 20
Horizontal Scale 1: 2000

04-21-1994

<<<<<< Cross Section: 0: (FN = SALT1.DAT) >>>>>>



04-12-1994

Calibration Analysis -- Cross-Section Comparison

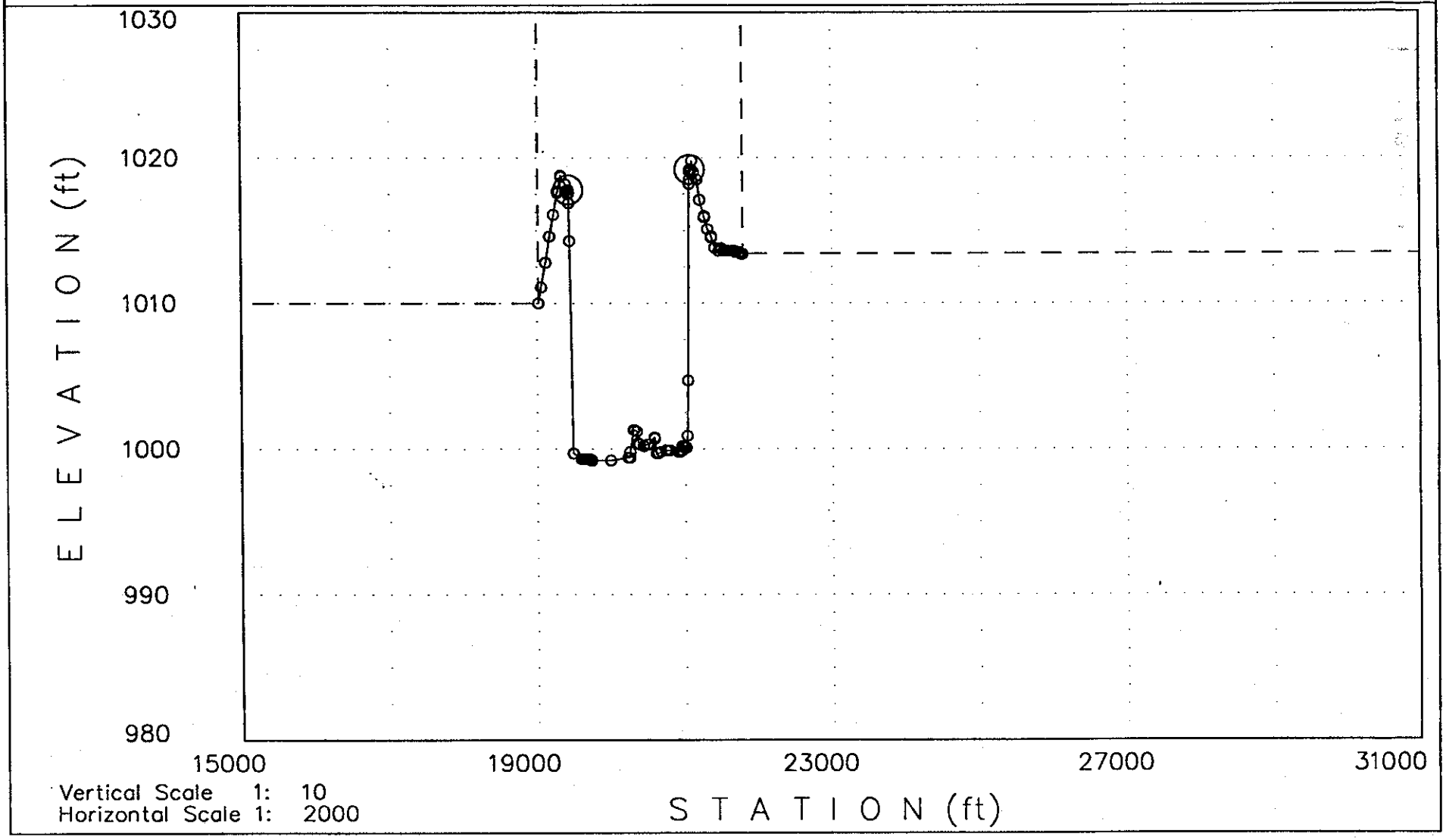
*Note: The first cross-section number listed represents the current river mile stationing. The second cross-section number listed represents the previous FIS stationing.

REACH 3

Cross - Section	Approx. Location	Previous Contractor	Date of Aerial Flight/Map Co.	X-Sect. Comparison
207.48/8.07	51st Ave.	Corps of Engineers	1983 Cooper Aerial Co.	River appears more channelized in bridge area
208.57/9.098	43rd Ave.	Corps of Engineers	1983 Cooper Aerial Co.	Minor changes in channel geometry in main channel
209.42/9.996	35th Ave.	Corps of Engineers	1983 Cooper Aerial Co.	Sediment has filled center portion of channel
210.55/11.036	27th Ave.	Corps of Engineers	1983 Cooper Aerial Co.	Dec. in irregularity in channel and overbanks
211.54/11.948	19th Ave.	Corps of Engineers	1983 Cooper Aerial Co.	Very little change in geometry; some sedimentation
212.69/13.072	7th Ave.	Corps of Engineers	1983 Cooper Aerial Co.	River is more channelized; some sedimentation
213.24/13.561	Central Ave.	Corps of Engineers	1983 Cooper Aerial Co.	More channelized; sections are not in same loc.; sed.
213.73/14.103	7th St.	Corps of Engineers	1983 Cooper Aerial Co.	Minor change in geometry; some sedimentation

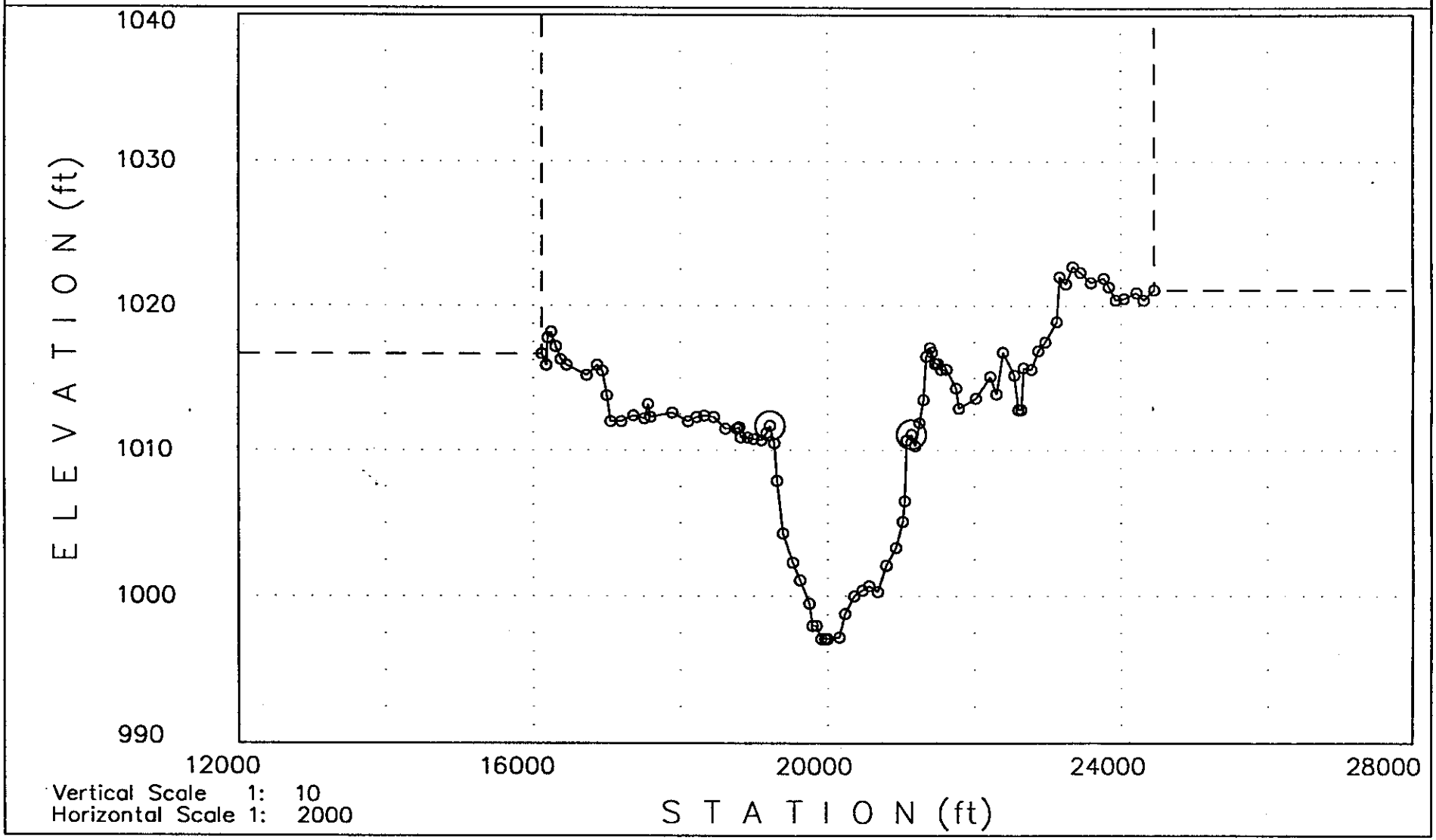
Reach 3 has undergone somewhat more alteration than the previous two reaches. This is primarily due to the addition of bridges that have created a more channelized riverbed geometry in the vicinity of the bridges. There also has been some accumulation of sediment in the main channel portions of the river.

<<<<<< Cross Section: 208.08: (FN = R3IA.DAT) >>>>>>



04-21-1994

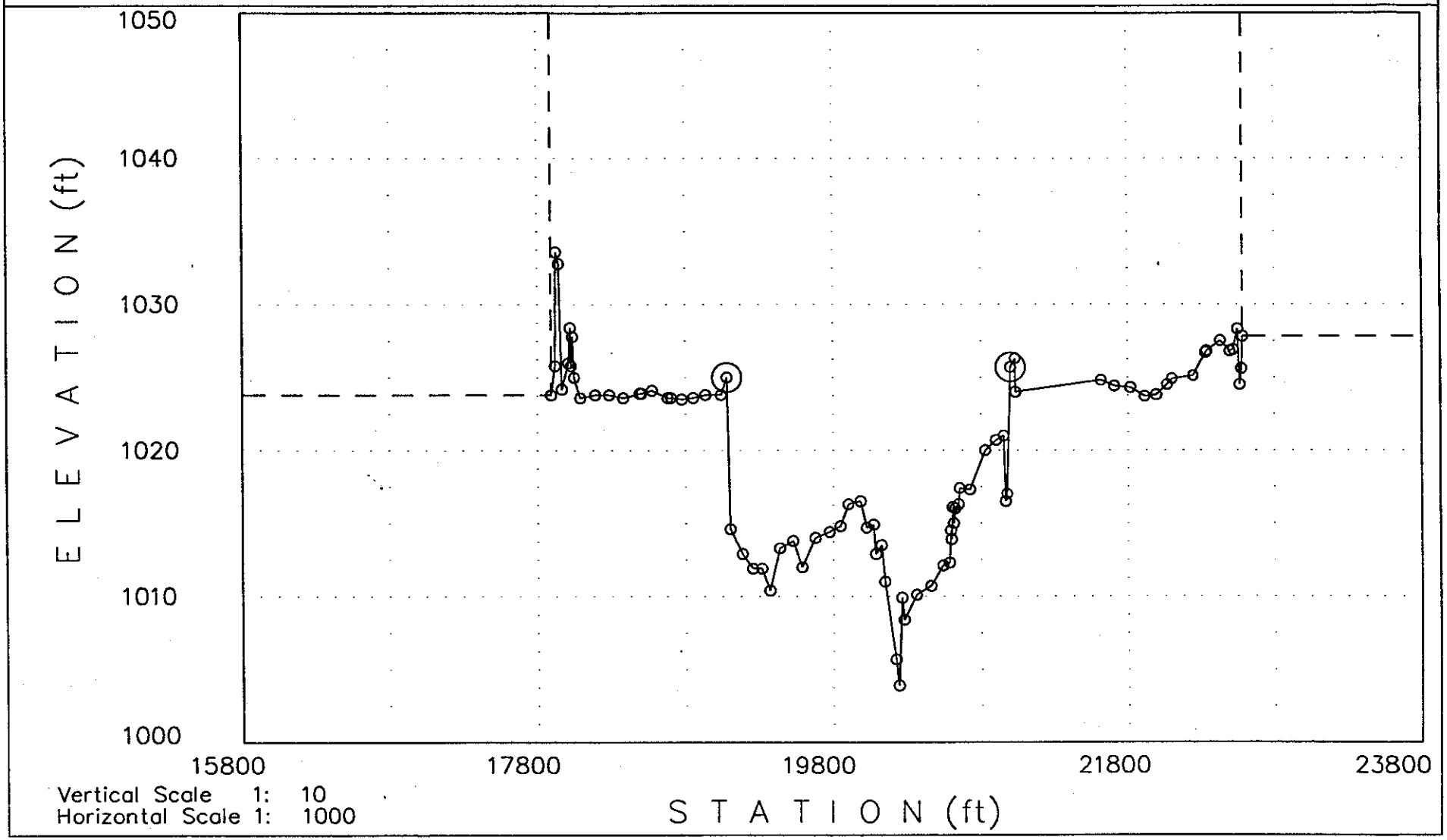
<<<<<< Cross Section: 8.07: (FN = SALT1.DAT) >>>>>>



Vertical Scale 1: 10
Horizontal Scale 1: 2000

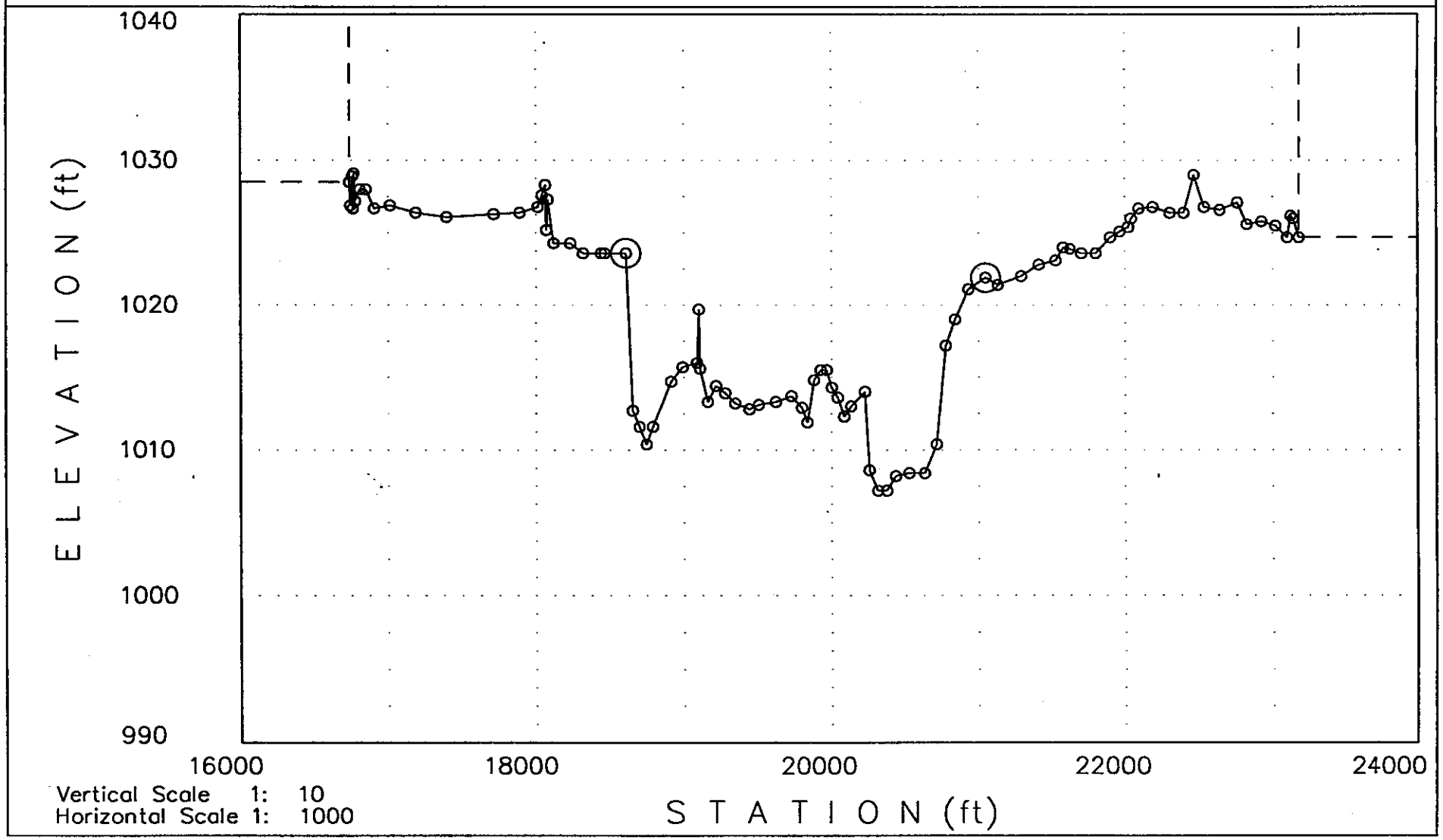
04-12-1994

<<<<<< Cross Section: 209.18: (FN = R3IA.DAT) >>>>>>



04-12-1994

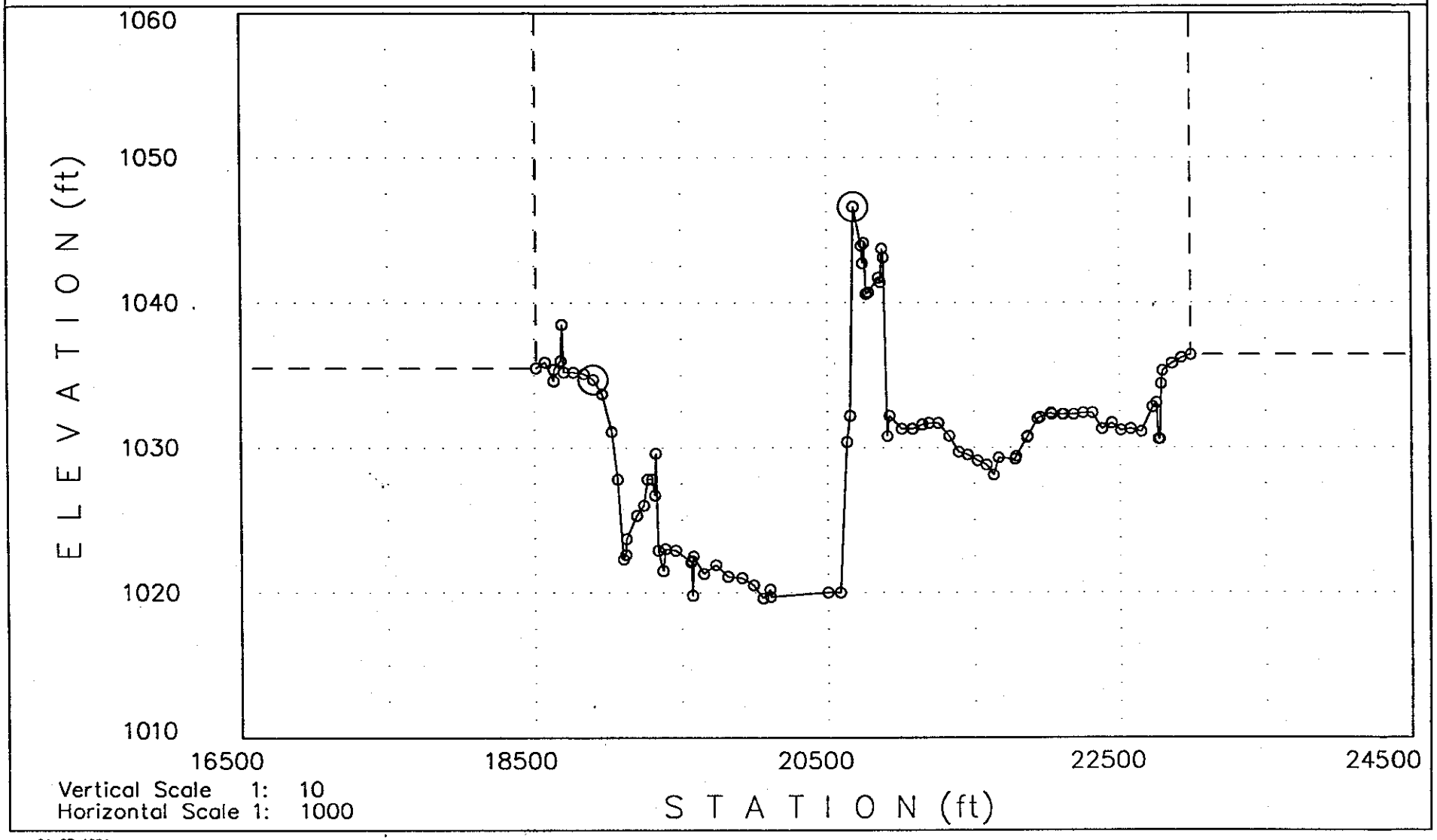
<<<<<< Cross Section: 9.098: (FN = SALT1.DAT) >>>>>>



Vertical Scale 1: 10
Horizontal Scale 1: 1000

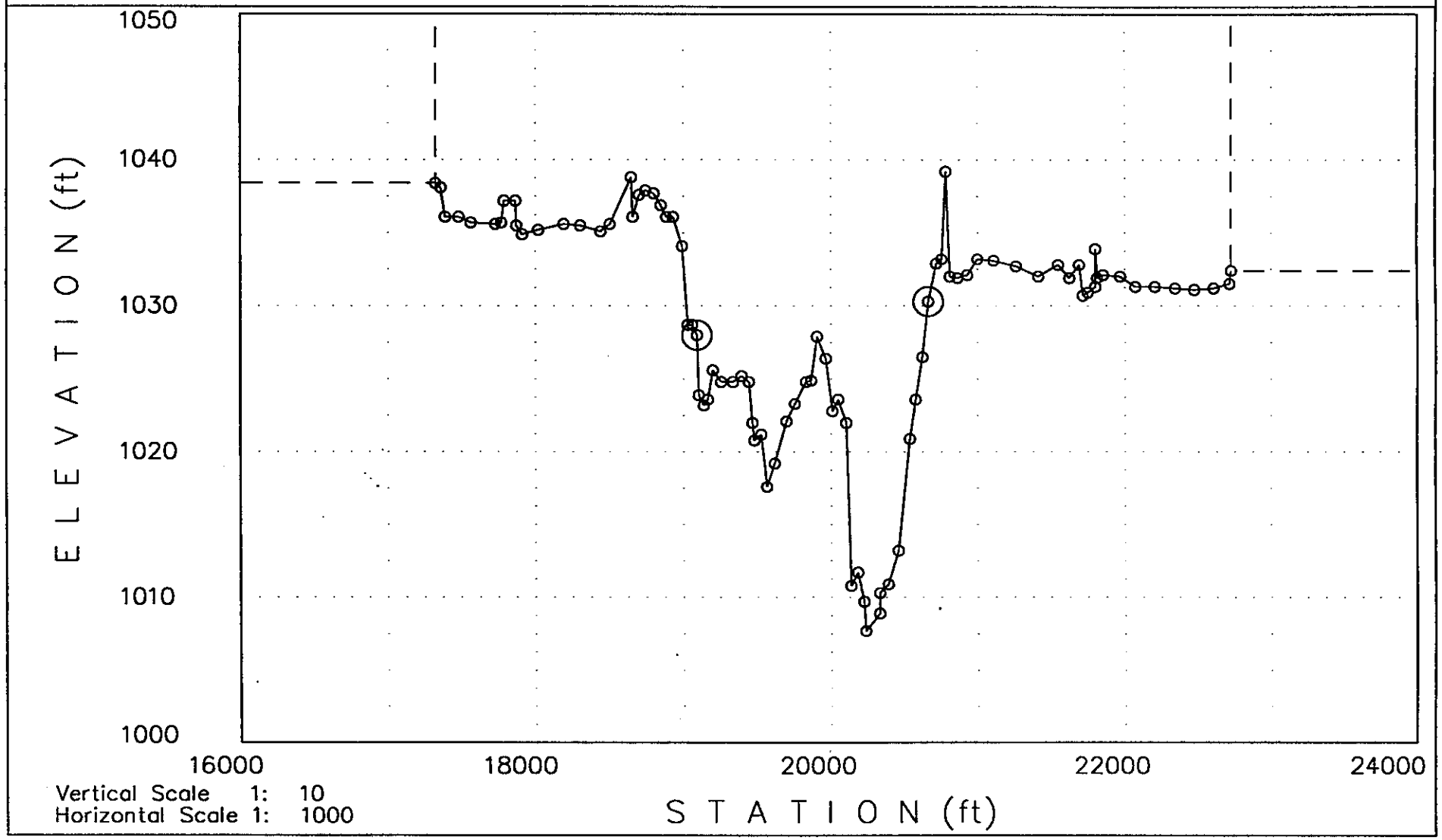
04-12-1994

<<<<<< Cross Section: 210.04: (FN = R31A.DAT) >>>>>>



04-27-1994

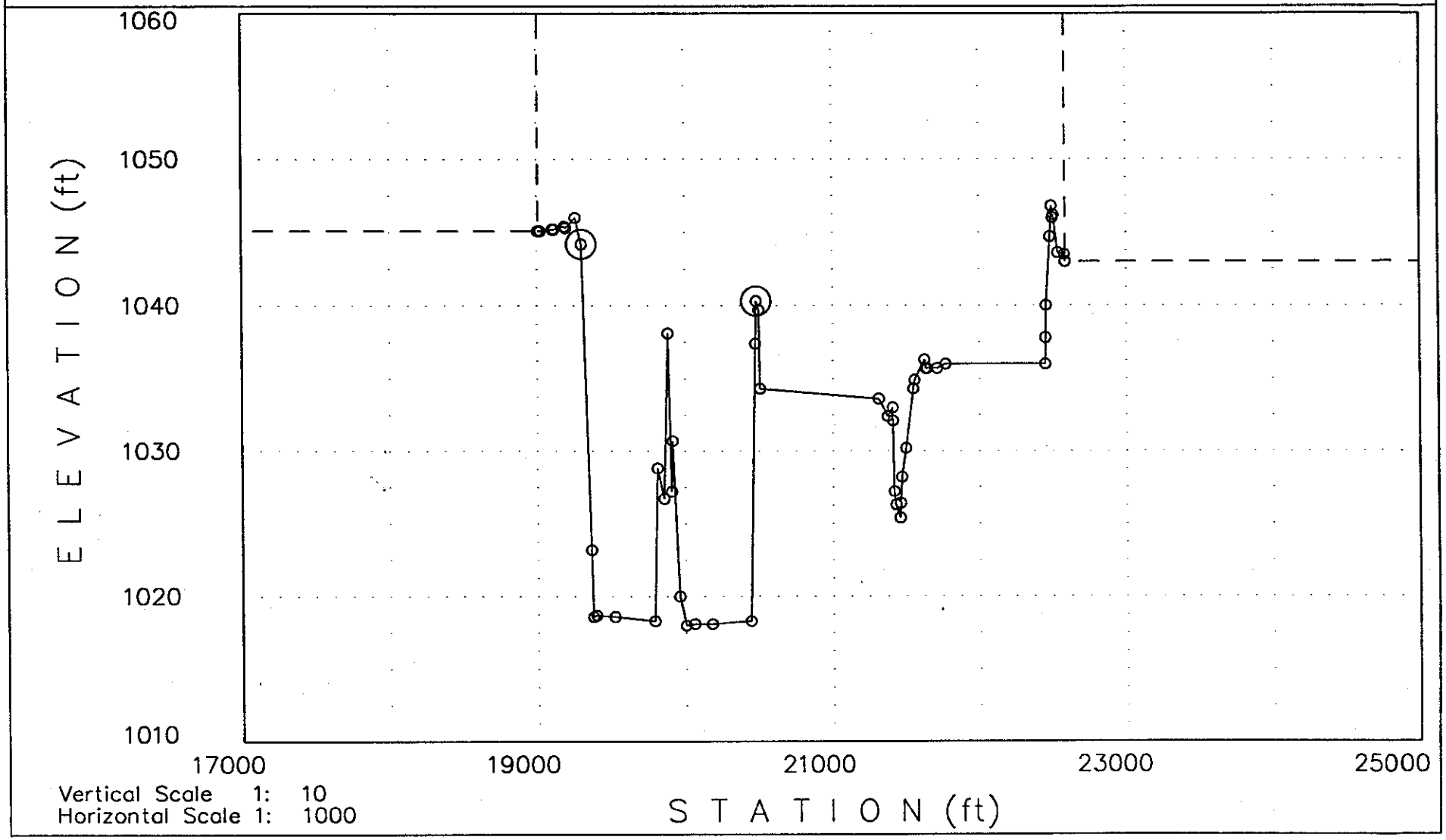
<<<<<< Cross Section: 9.996: (FN = SALT1.DAT) >>>>>>



Vertical Scale 1: 10
Horizontal Scale 1: 1000

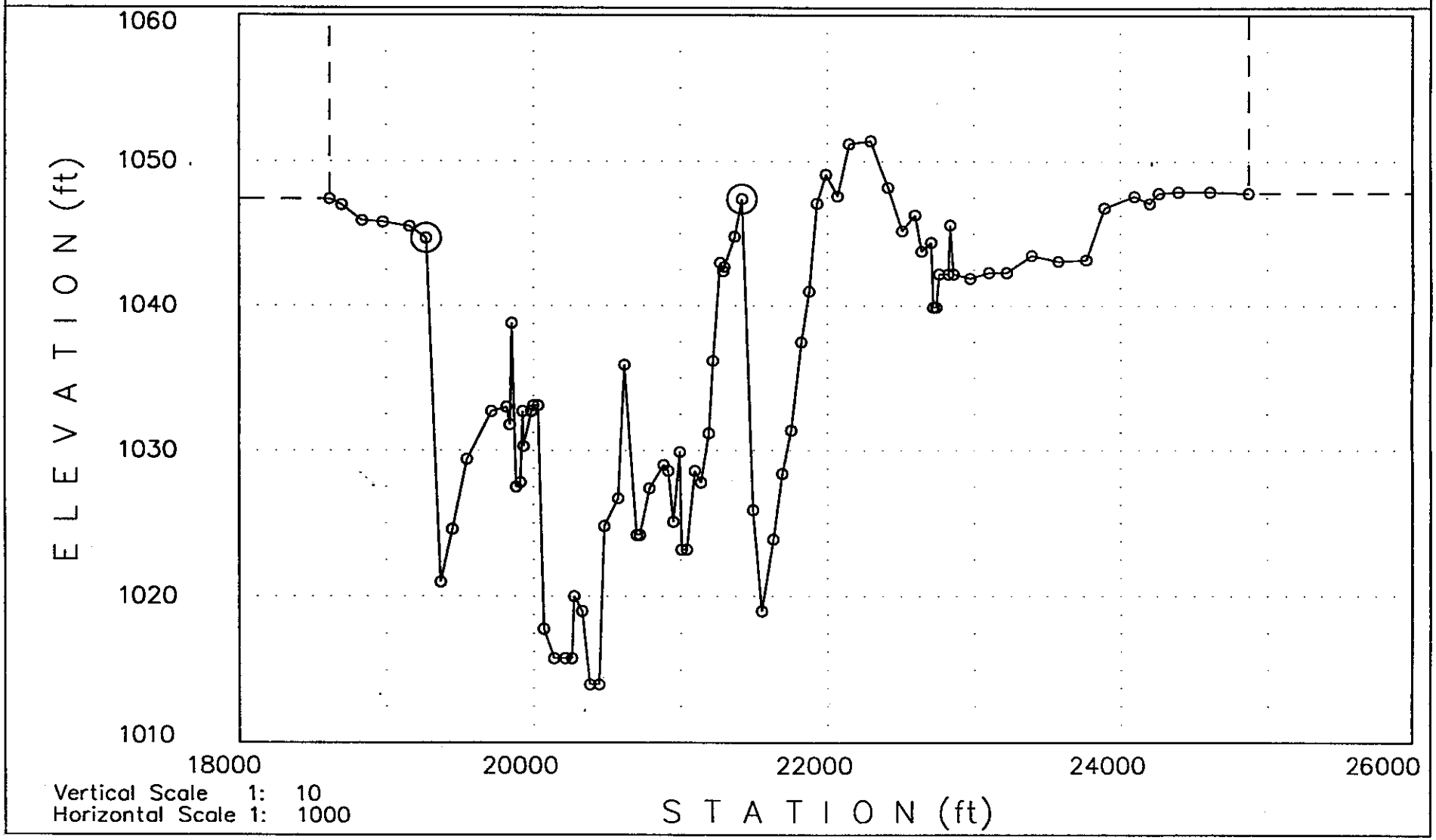
04-27-1994

<<<<<< Cross Section: 211.17: (FN = R3IA.DAT) >>>>>>



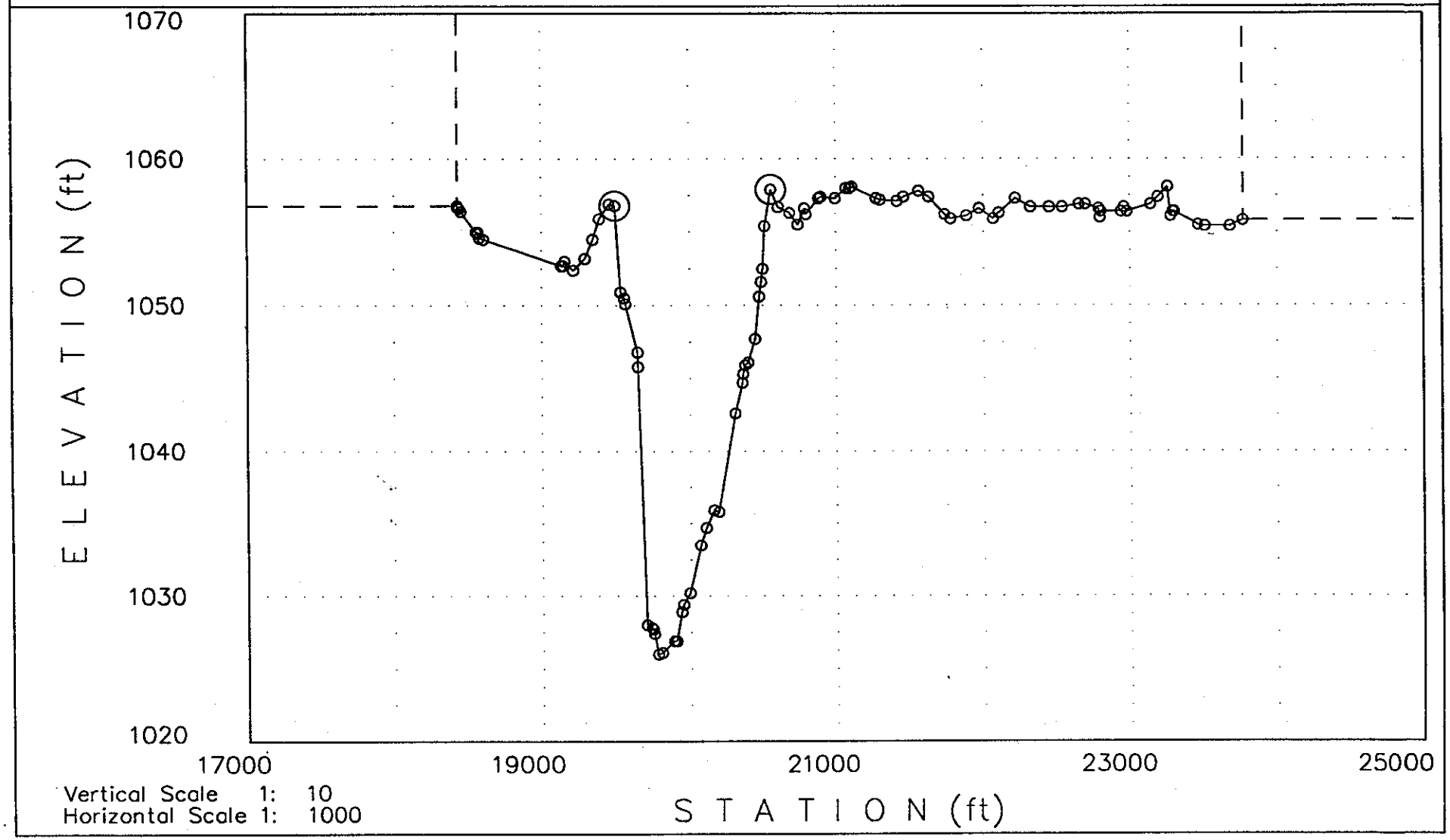
04-12-1994

<<<<<< Cross Section: 11.036: (FN = SALT1.DAT) >>>>>>



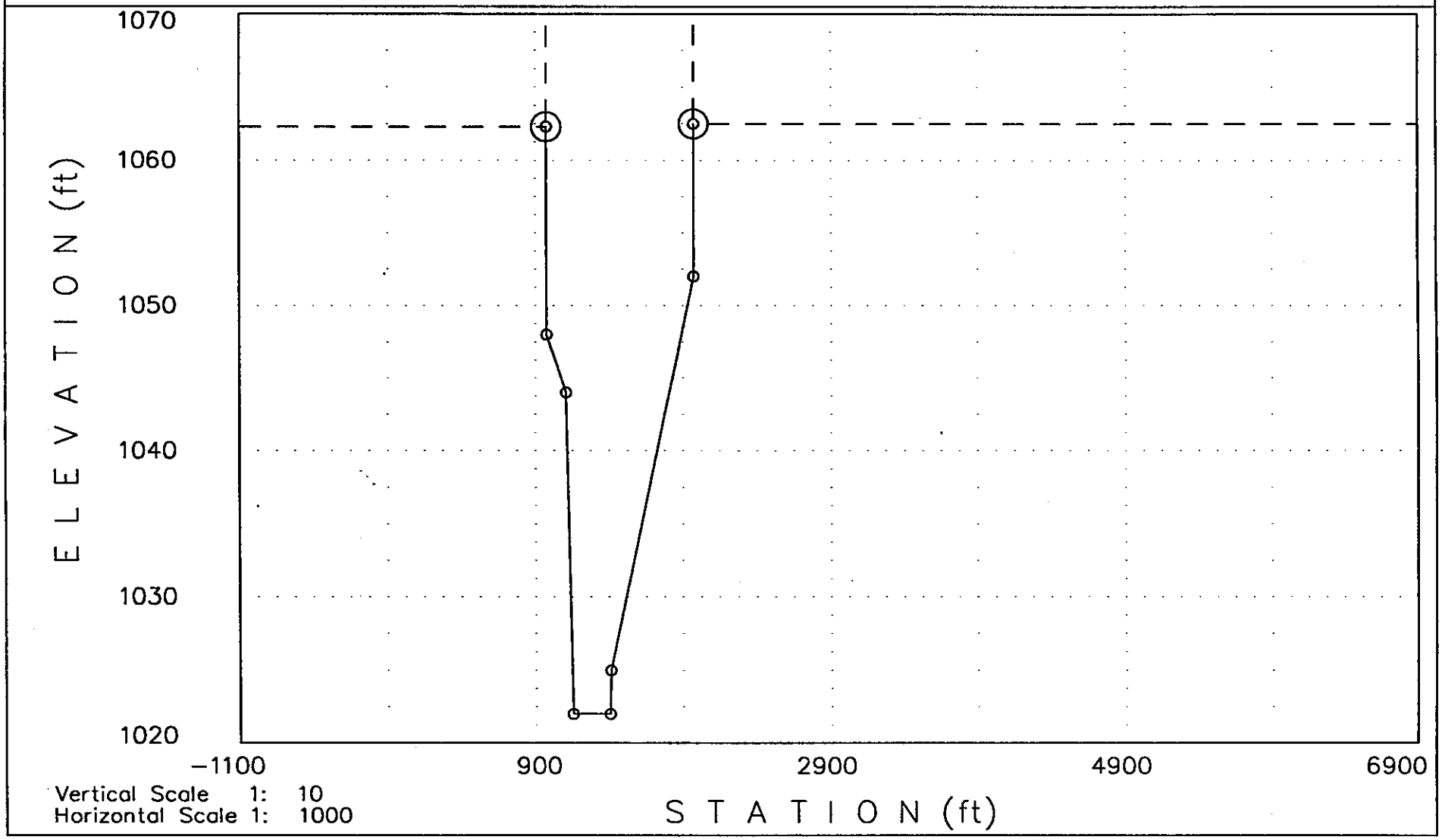
04-12-1994

<<<<<< Cross Section: 212.16: (FN = R3IA.DAT) >>>>>>



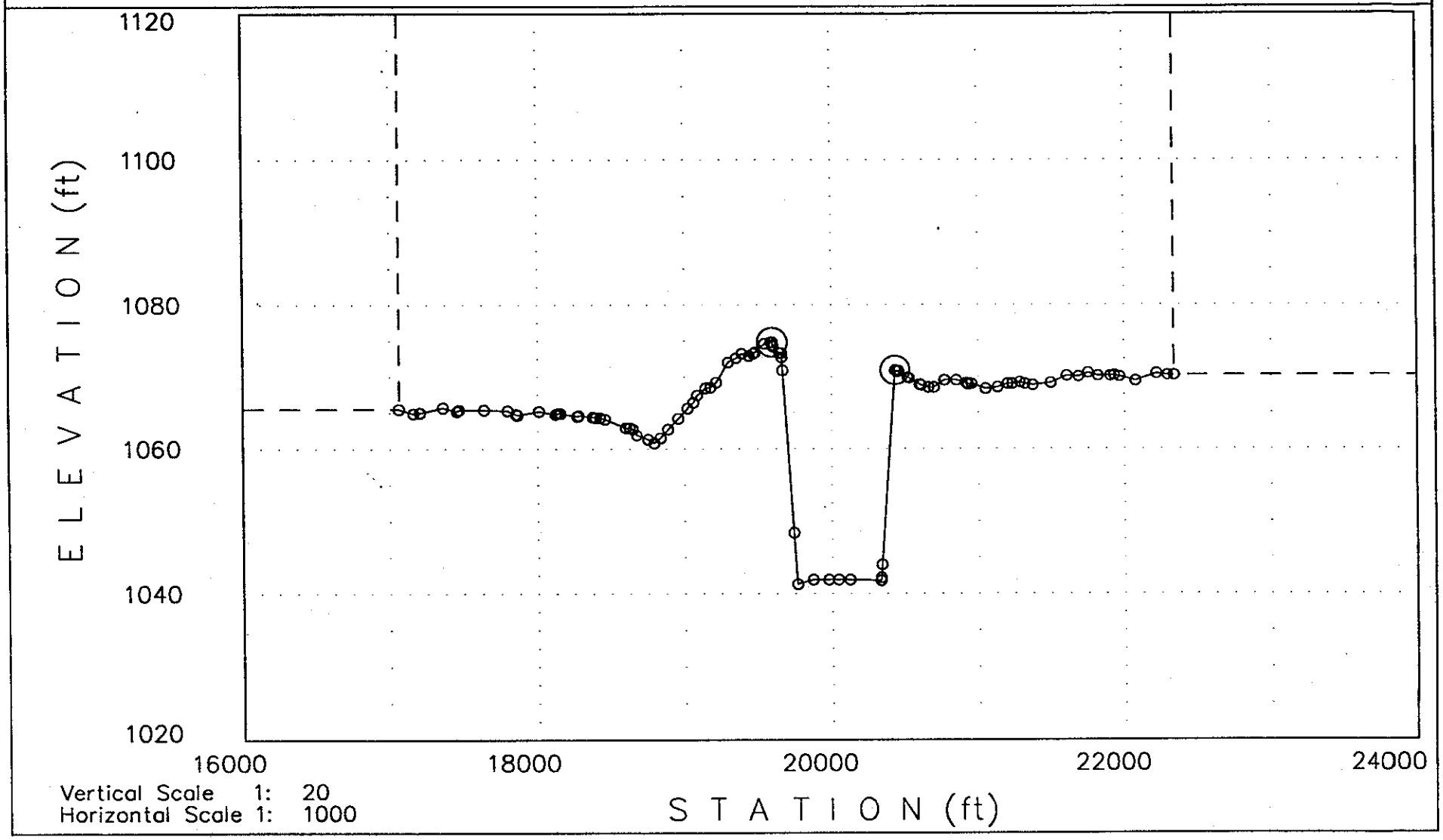
04-12-1994

<<<<<< Cross Section: 11.948: (FN = SALT1.DAT) >>>>>>



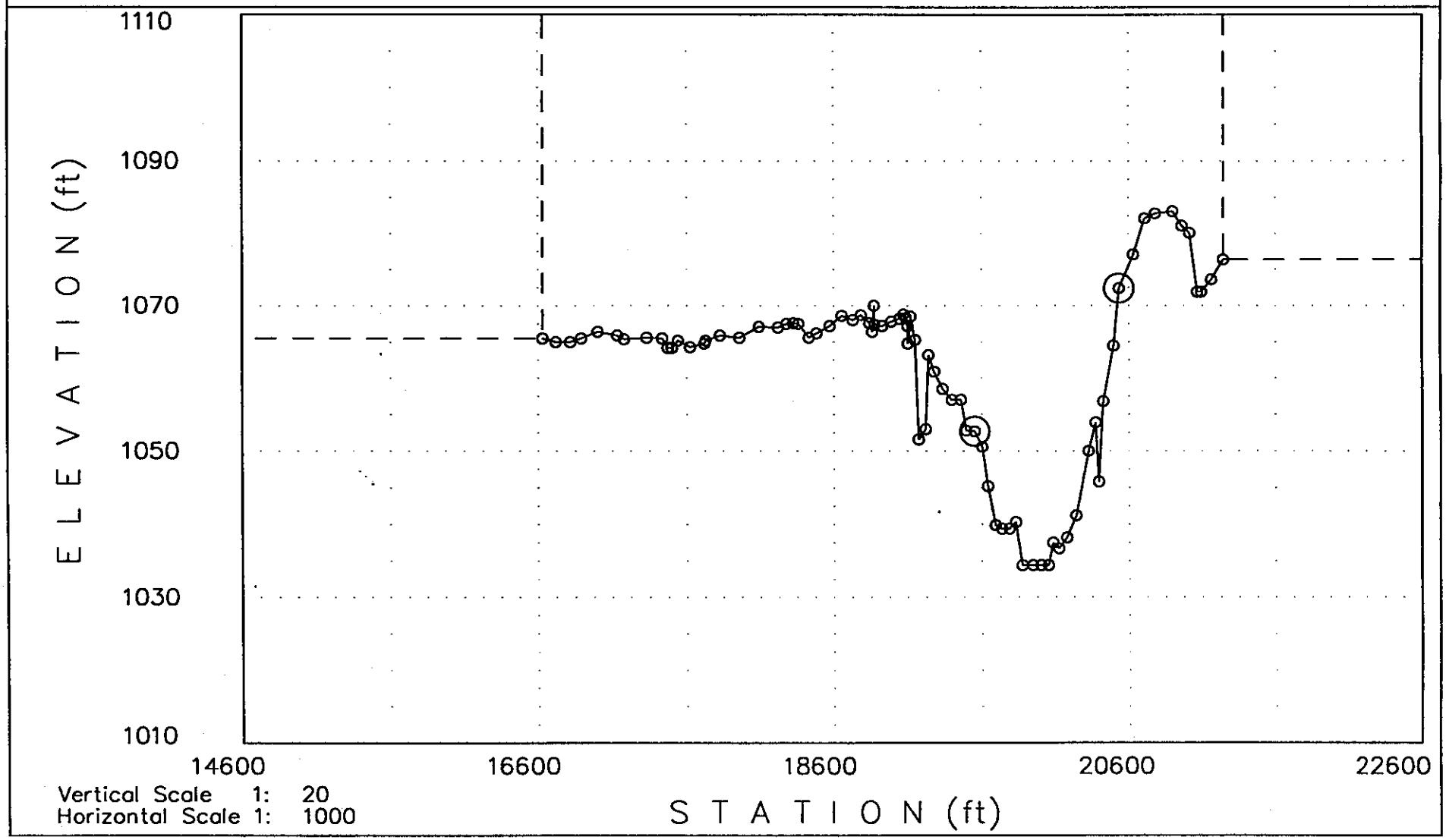
04-12-1994

<<<<<< Cross Section: 213.31: (FN = R3IA.DAT) >>>>>>



04-27-1994

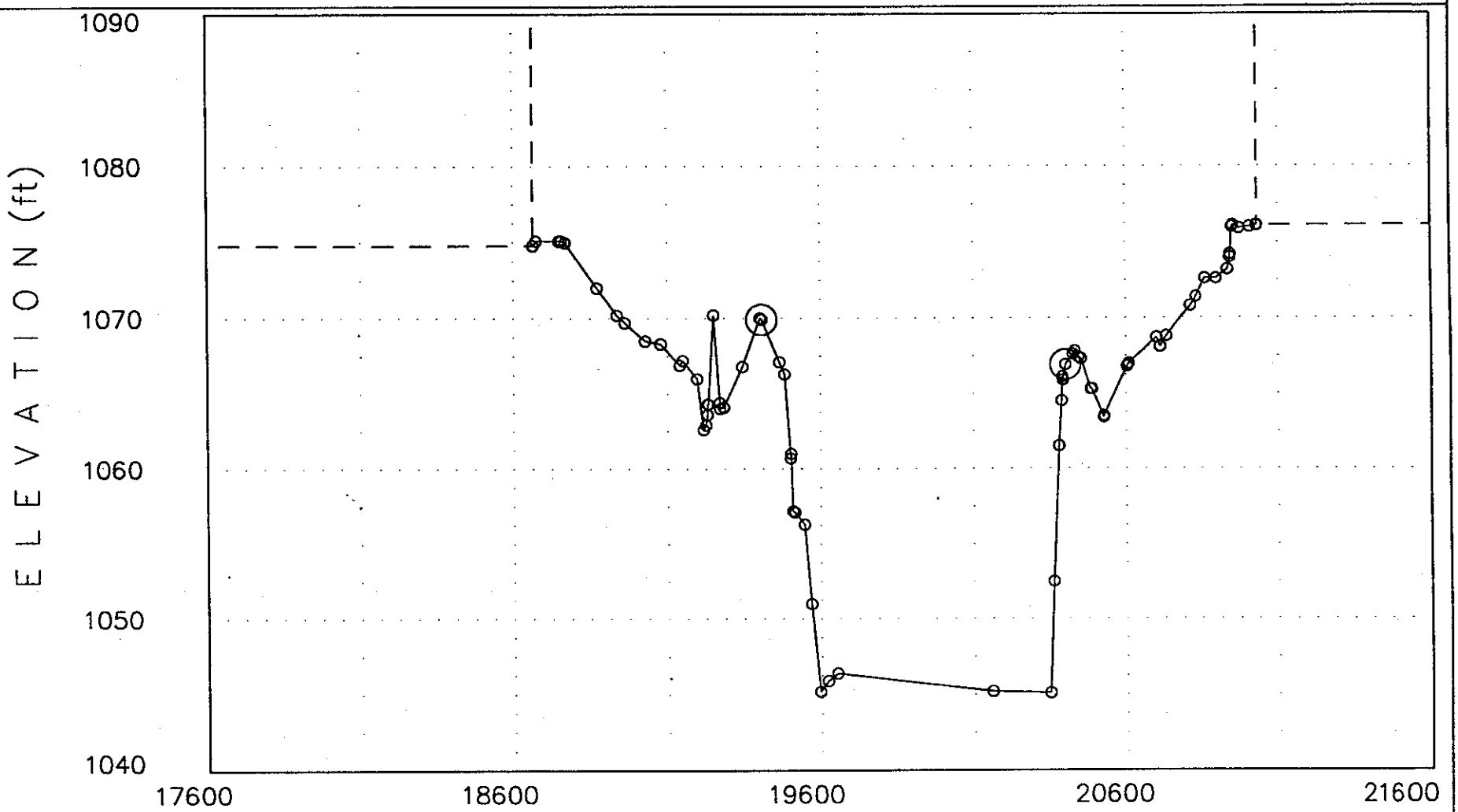
<<<<<< Cross Section: 13.072: (FN = SALT1.DAT) >>>>>>



Vertical Scale 1: 20
Horizontal Scale 1: 1000

04-27-1994

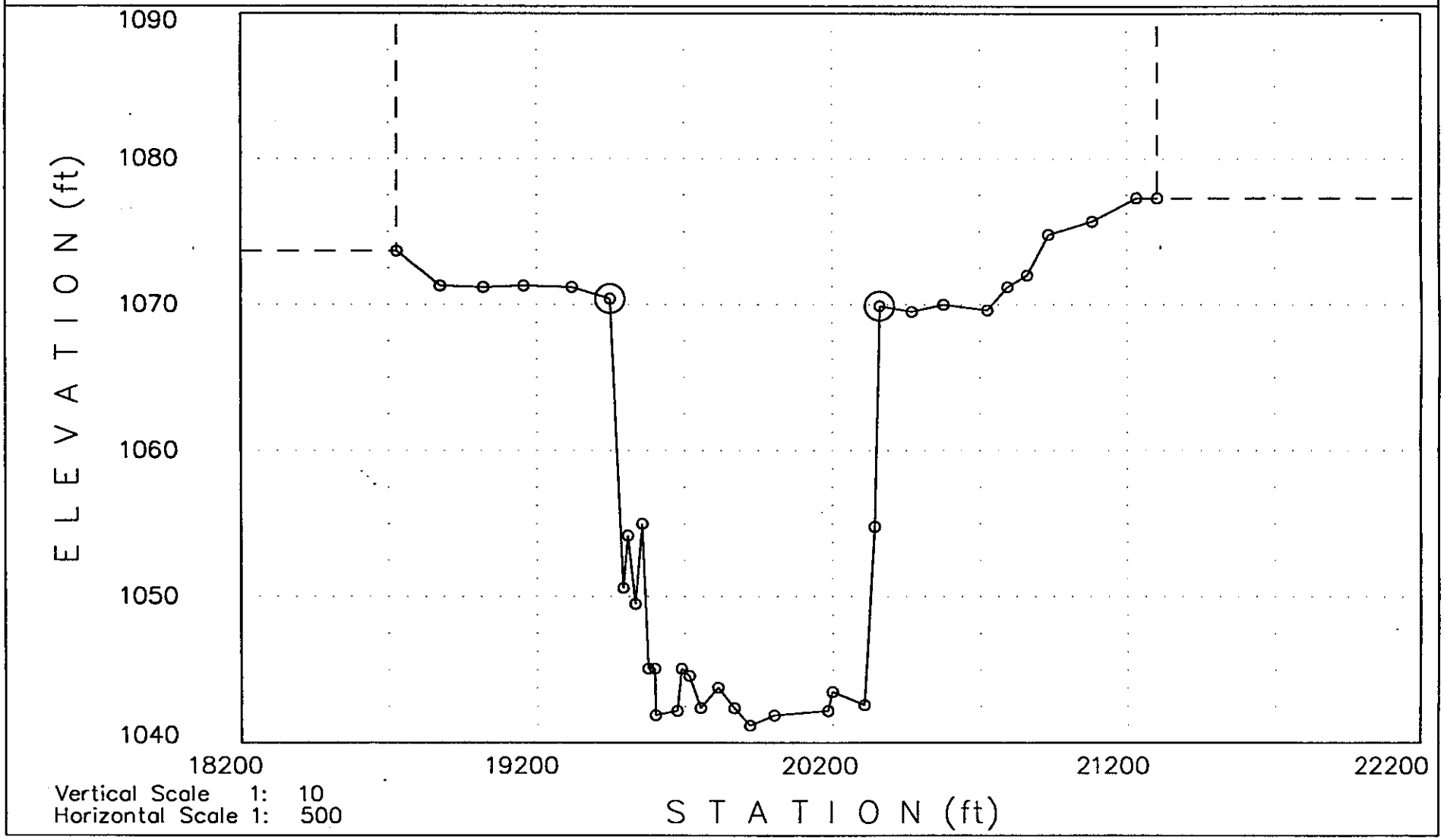
<<<<<< Cross Section: 213.87: (FN = R31A.DAT) >>>>>>



Vertical Scale 1: 10
Horizontal Scale 1: 500

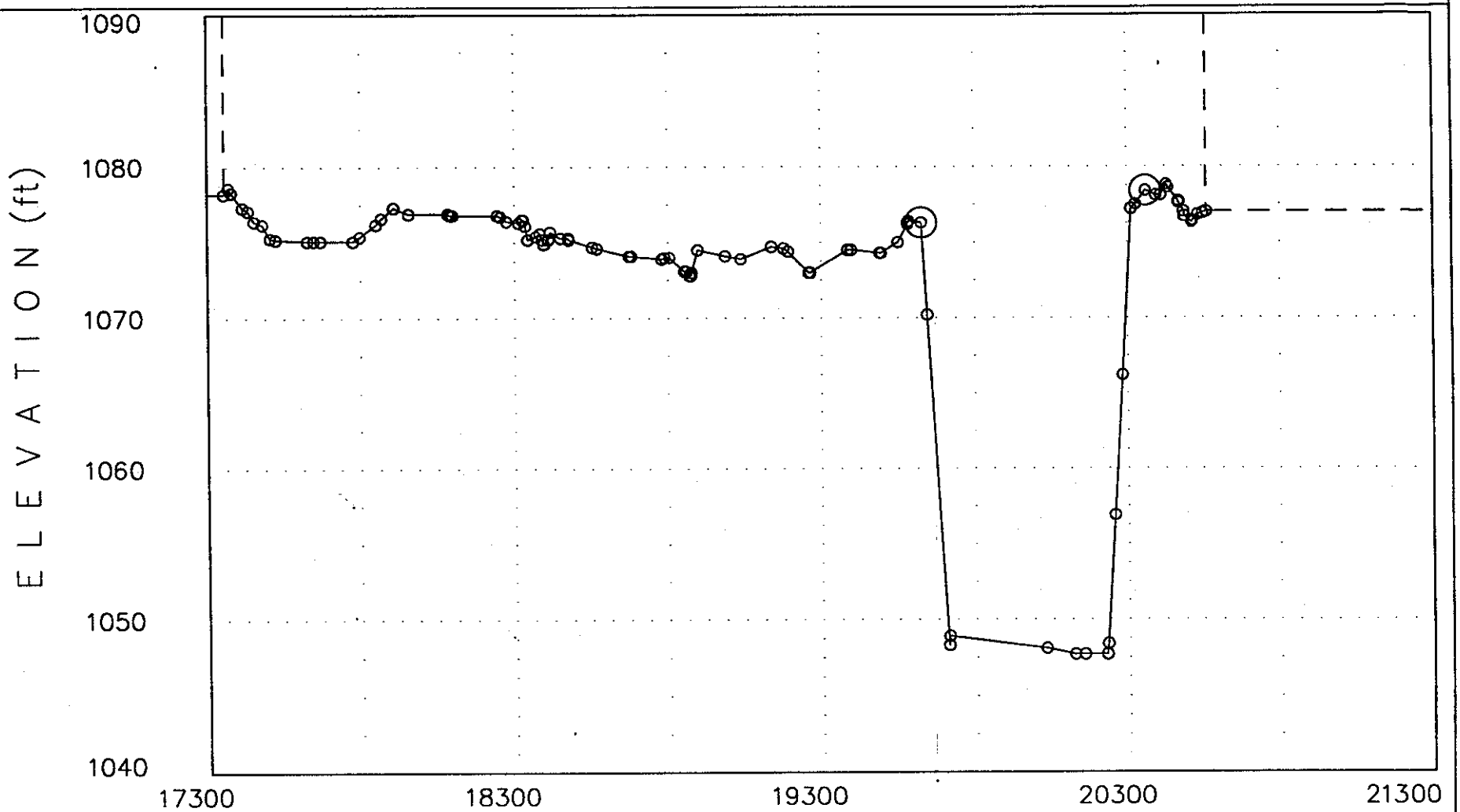
04-12-1994

<<<<<< Cross Section: 13.561: (FN = SALT1.DAT) >>>>>>



04-12-1994

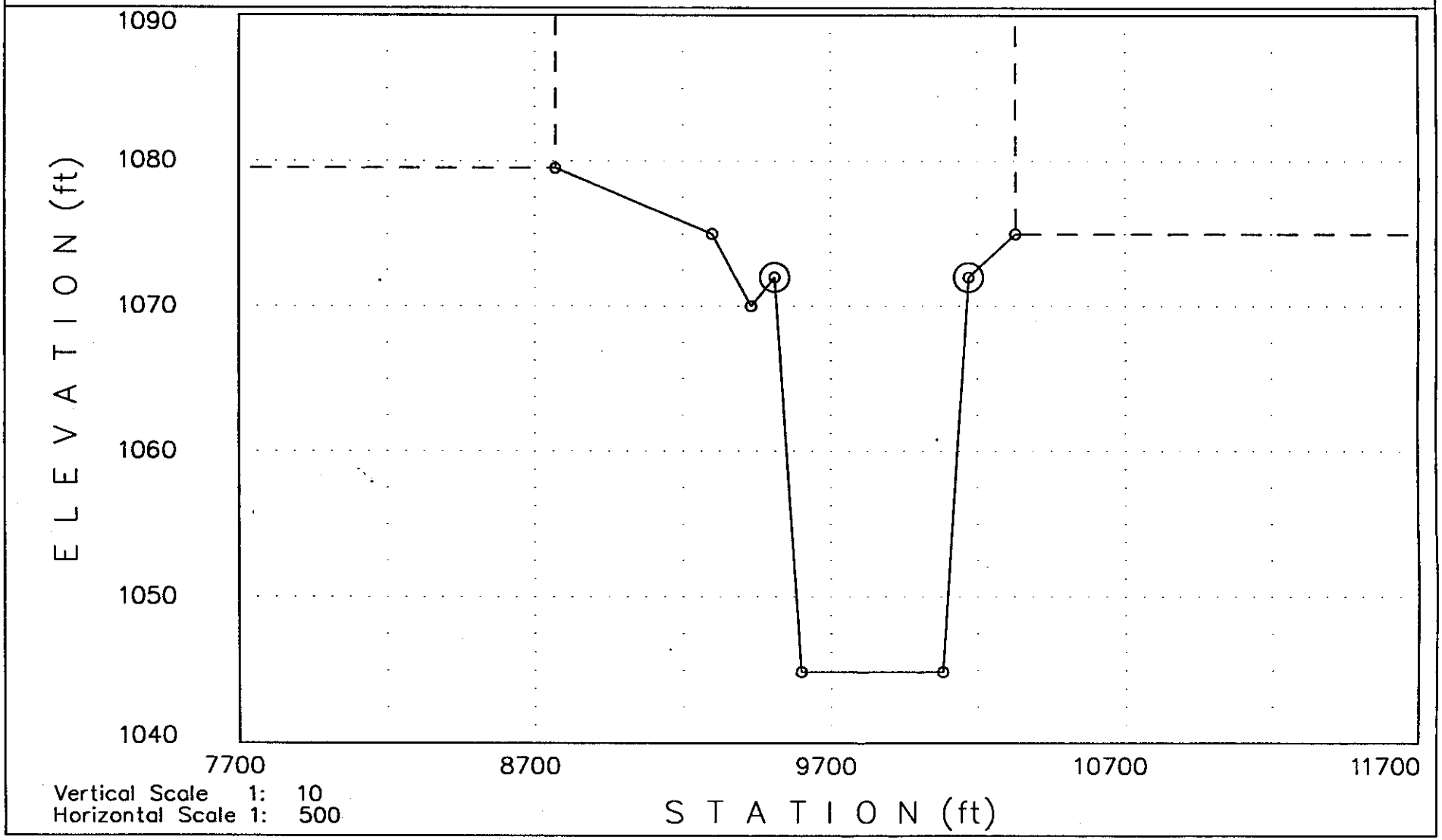
<<<<<< Cross Section: 214.37: (FN = R3IA.DAT) >>>>>>



Vertical Scale 1: 10
Horizontal Scale 1: 500

04-12-1994

<<<<<< Cross Section: 14.103: (FN = SALT1.DAT) >>>>>>



04-12-1994

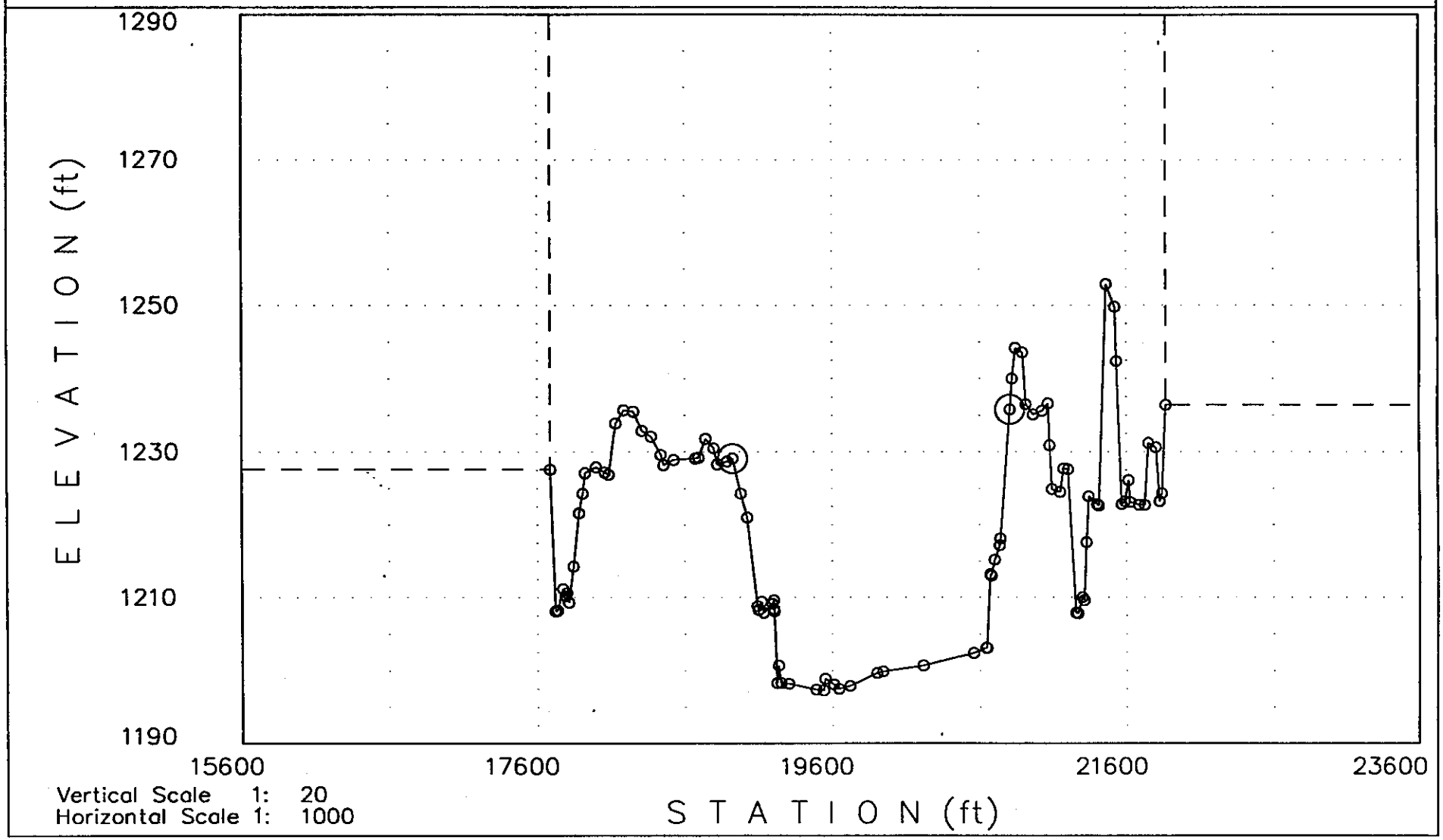
*Note: The first cross-section number listed represents the current river mile stationing. The second cross-section number listed represents the previous FIS stationing.

REACH 5

Cross - Section	Approx. Location	Previous Contractor	Date of Aerial Flight/Map Co.	X-Sect. Comparison
228.36/29.017	E. of Country Club Rd.	Burgess & Niple	1984 Kenney Aerial Mapping	Inc. in irregularity in channel and overbanks
229.87/30.815	Horne Rd.	Burgess & Niple	1984 Kenney Aerial Mapping	Minor changes in geometry of main channel
230.47/31.522	Stapely Dr.	Burgess & Niple	1984 Kenney Aerial Mapping	Very minor changes in channel geometry
231.54/32.655	Gilbert Rd.	Burgess & Niple	1984 Kenney Aerial Mapping	Very minor changes in channel geometry
232.74/33.892	E. Of Lindsay Rd.	Burgess & Niple	1984 Kenney Aerial Mapping	River alignment has shifted; some sedimentation
233.51/34.856	Val Vista Dr.	Burgess & Niple	1984 Kenney Aerial Mapping	Very little change in geometry; some sedimentation
235.48/36.775	Between Val Vista & Granite Reef Dam	Burgess & Niple	1984 Kenney Aerial Mapping	Virtually no change in channel geometry
237.59/39.098	Granite Reef Dam	Burgess & Niple	1984 Kenney Aerial Mapping	Dec. in irregularity; sedimentation in channel

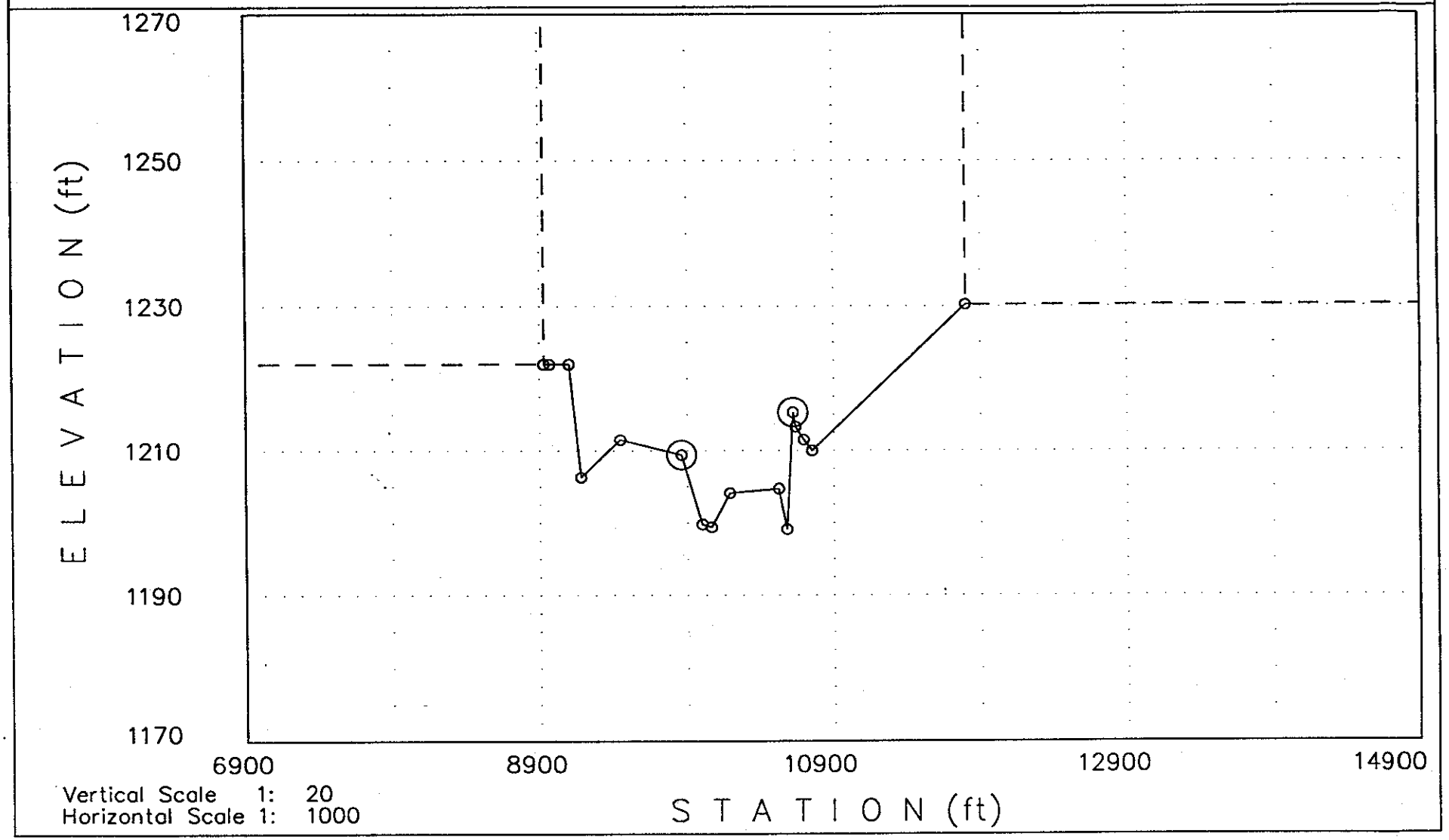
The lower portion of Reach 5 has experienced minor changes in cross-sectional geometry, mostly from increases in irregularity. The remainder of the Reach, from approximately Stapely Drive to Granite Reef Dam, has changed very little over the past 10 years. Small amounts of sedimentation and minor shifts in river alignment exist within this portion of the Reach.

<<<<<< Cross Section: 229.03: (FN = R5PRQ.DAT) >>>>>>



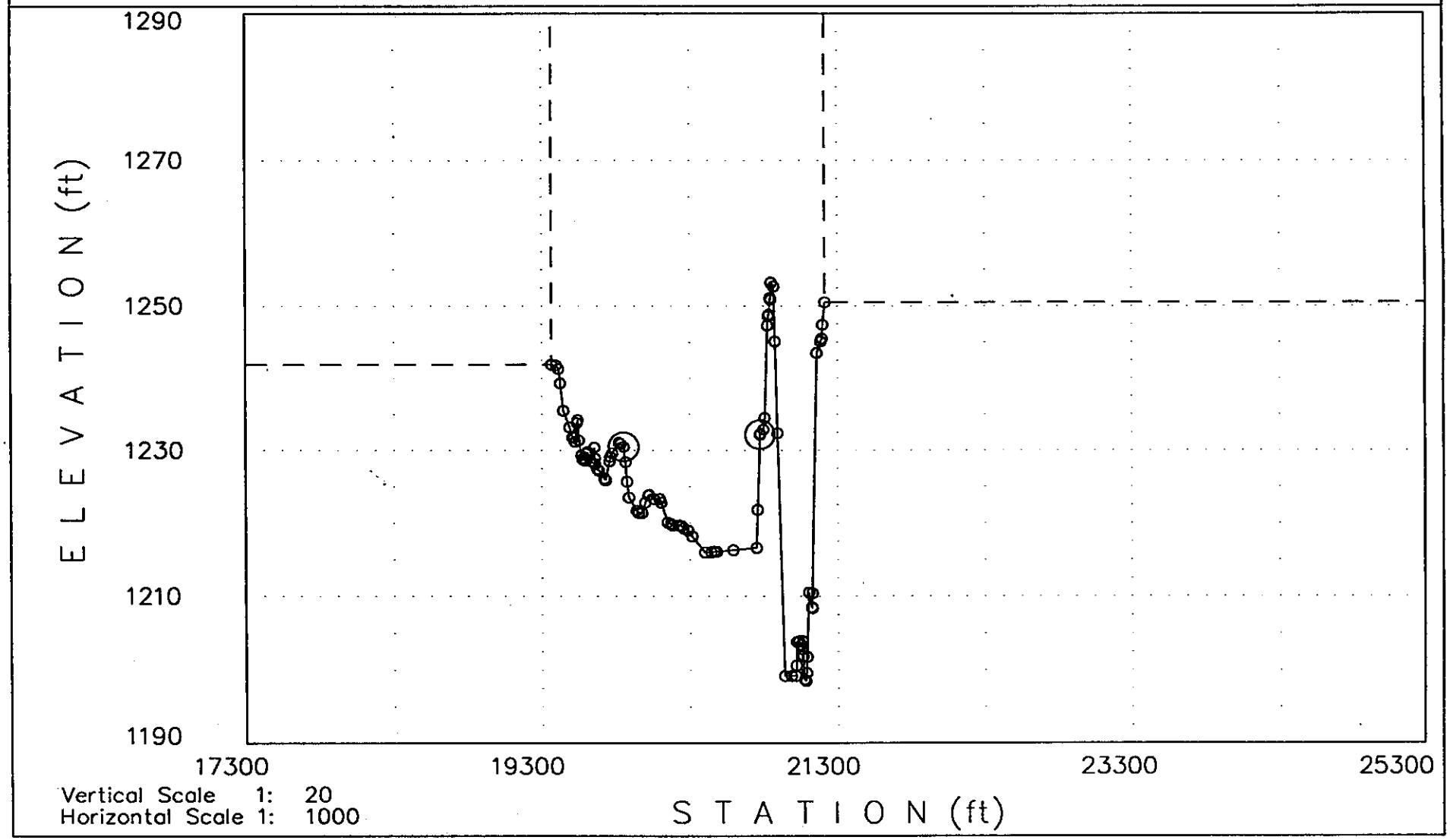
04-12-1994

<<<<<< Cross Section: 29.017: (FN = SALT.I) >>>>>>



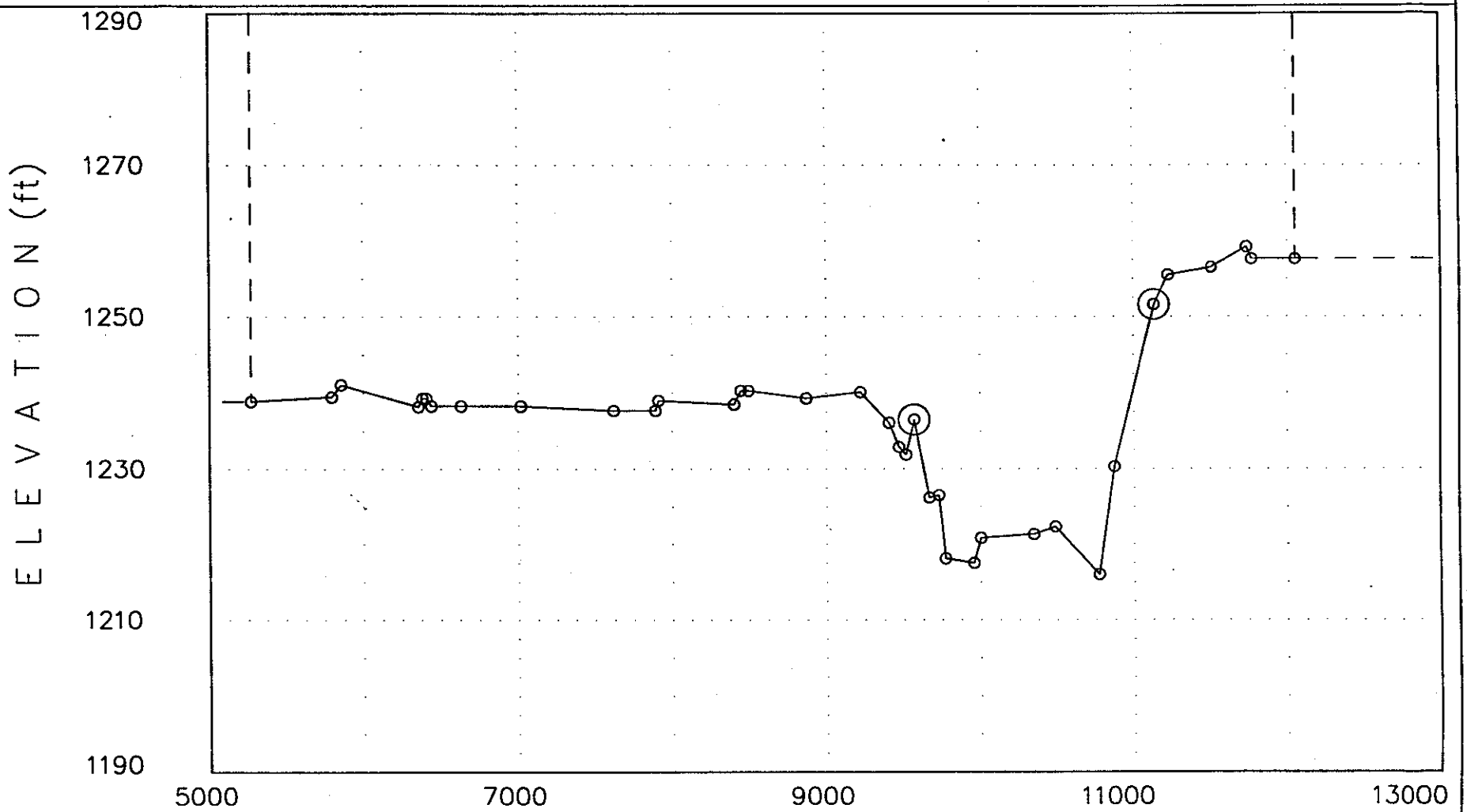
04-12-1994

<<<<<< Cross Section: 230.55: (FN = R5PRQ.DAT) >>>>>>



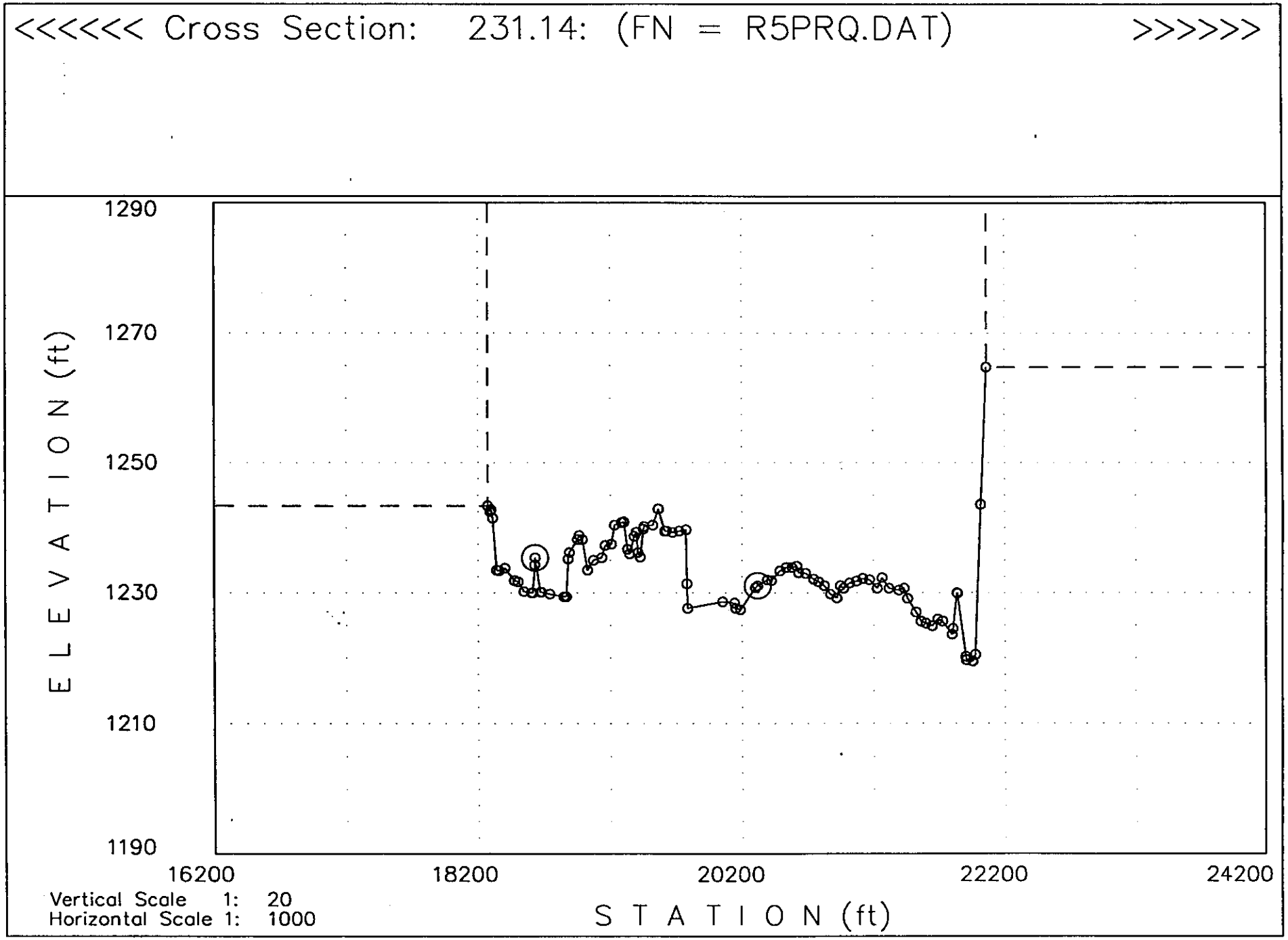
04-20-1994

<<<<<< Cross Section: 30.815: (FN = SALT.I) >>>>>>



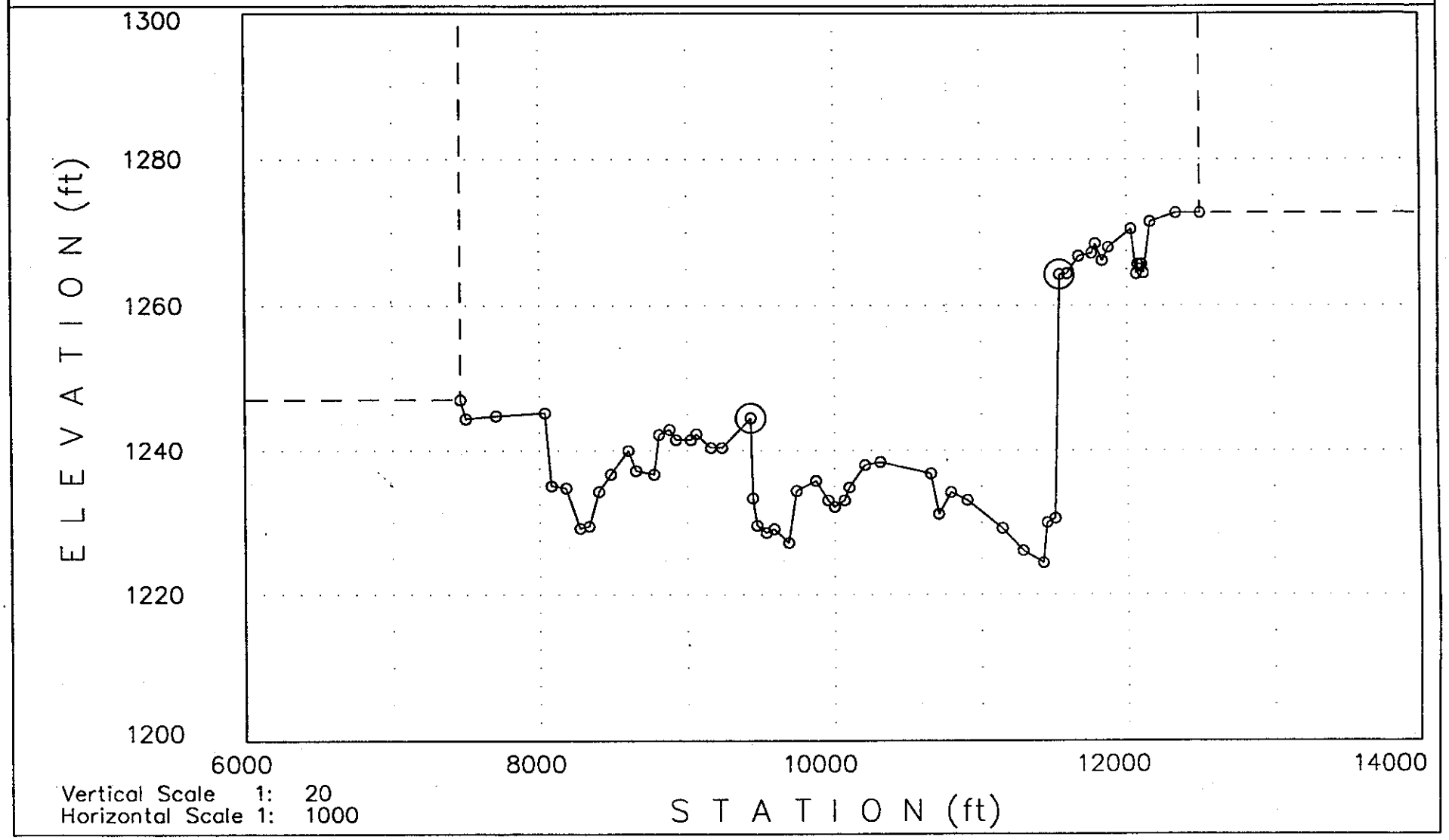
Vertical Scale 1: 20
Horizontal Scale 1: 1000

04-12-1994


<<<<<< Cross Section: 231.14: (FN = R5PRQ.DAT) >>>>>>
ELEVATION (ft)
1290
1270
1250
1230
1210
1190
16200
18200
20200
22200
24200
STATION (ft)
Vertical Scale 1: 20
Horizontal Scale 1: 1000

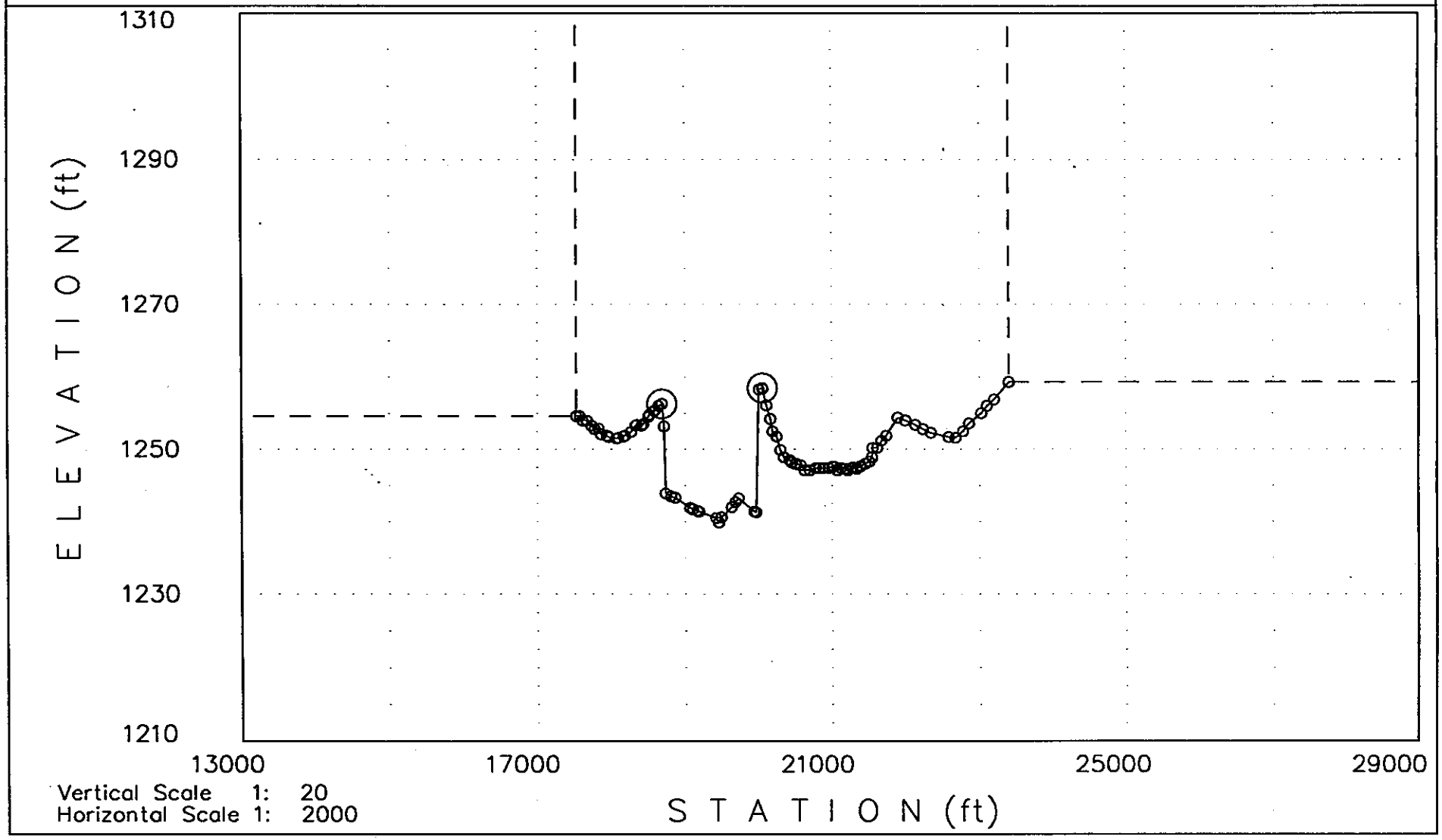
04-20-1994

<<<<<< Cross Section: 31.522: (FN = SALT.I) >>>>>>



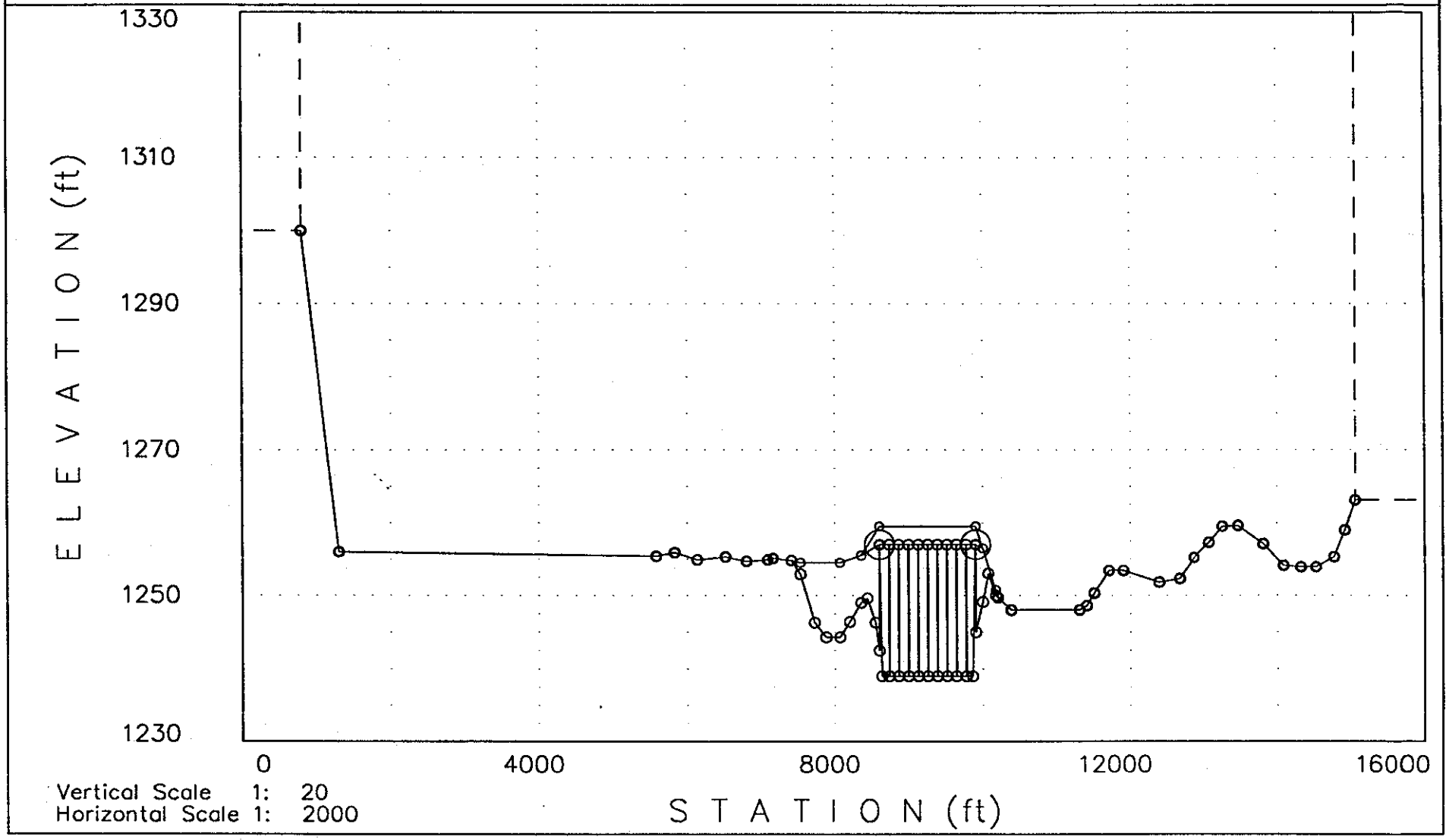
04-12-1994

<<<<<< Cross Section: 232.2: (FN = R5PRQ.DAT) >>>>>>



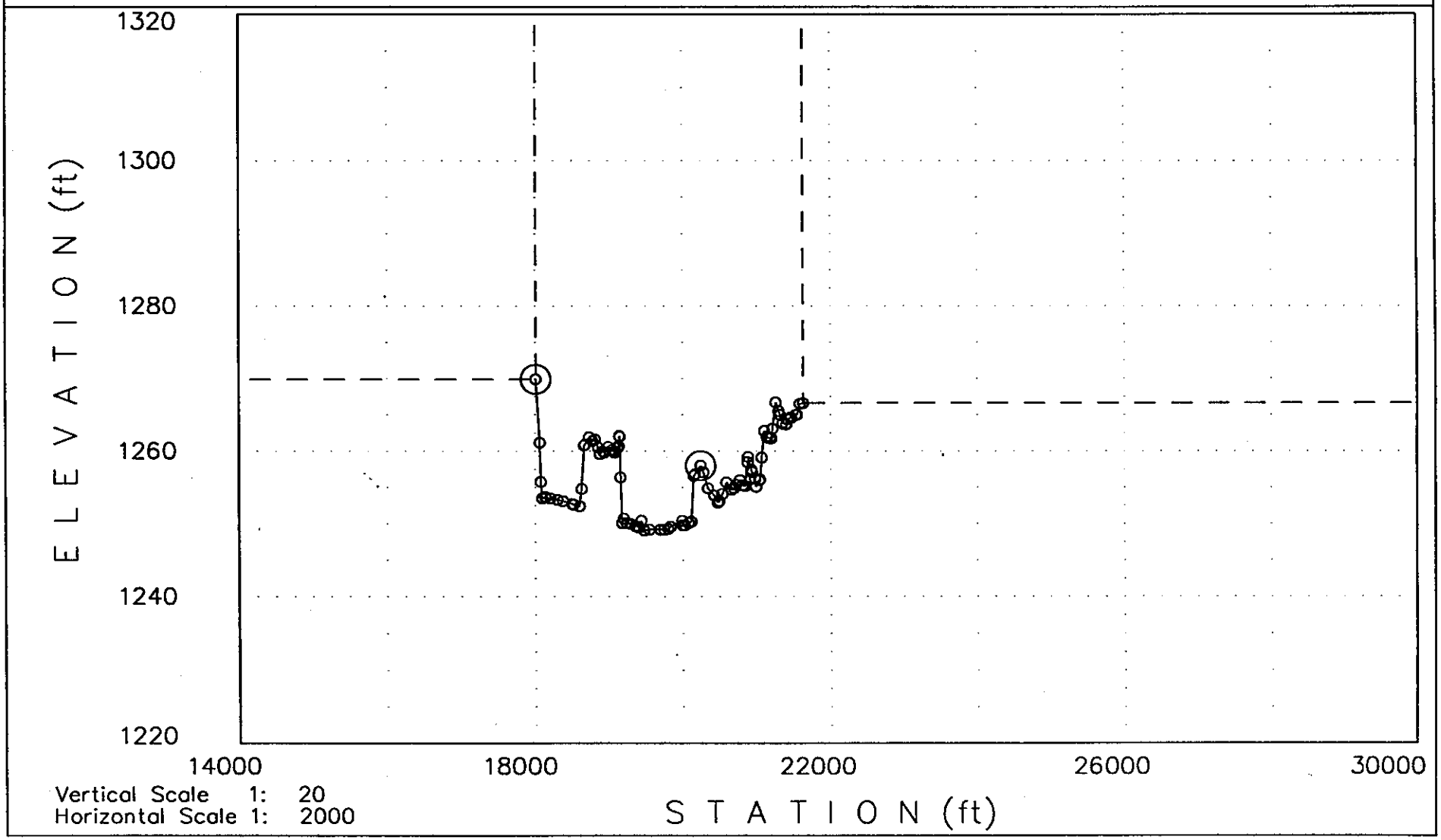
04-20-1994

<<<<<< Cross Section: 32.655: (FN = SALT.I) >>>>>>



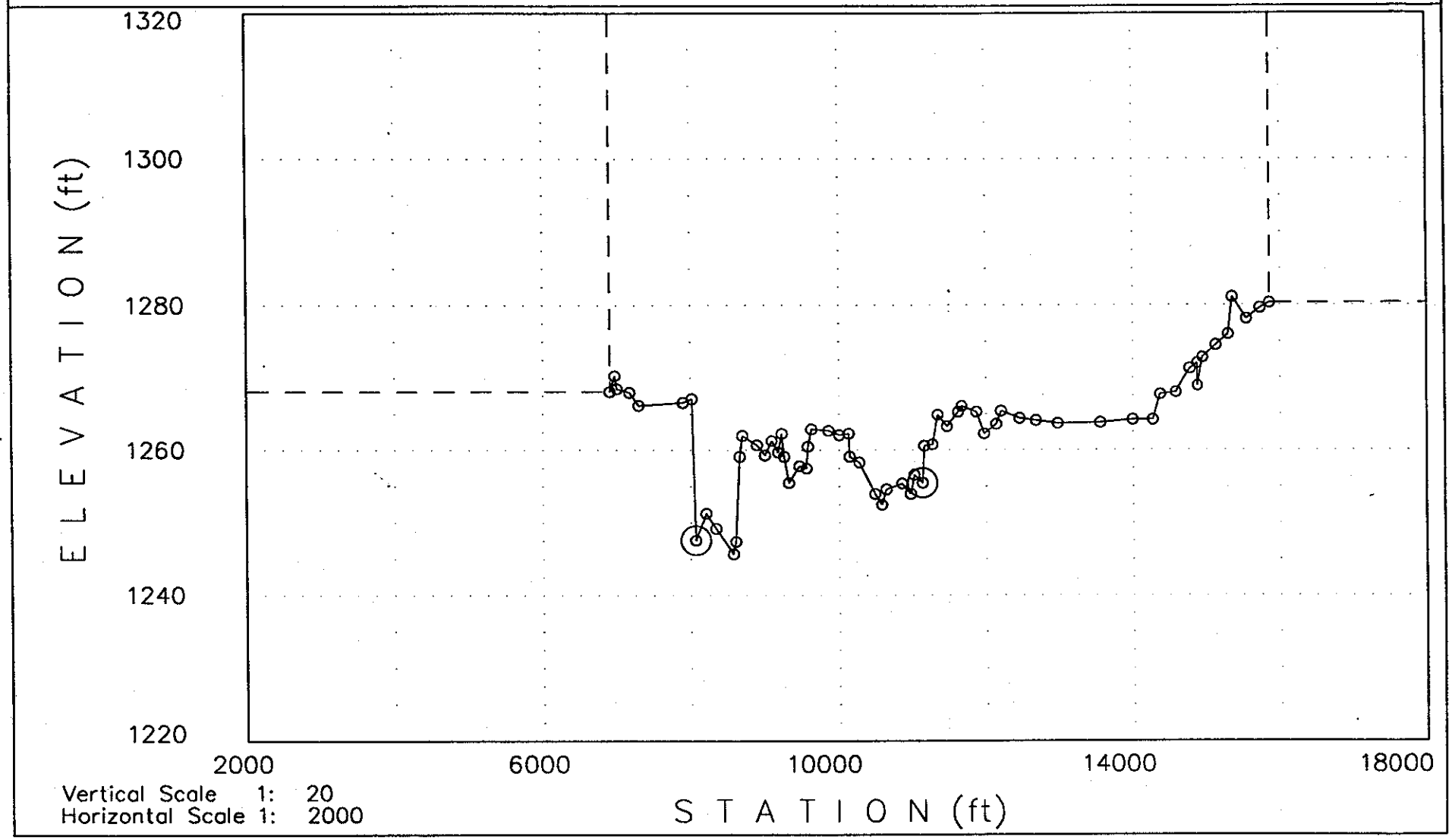
04-12-1994

<<<<<< Cross Section: 233.42: (FN = R5PRQ.DAT) >>>>>>



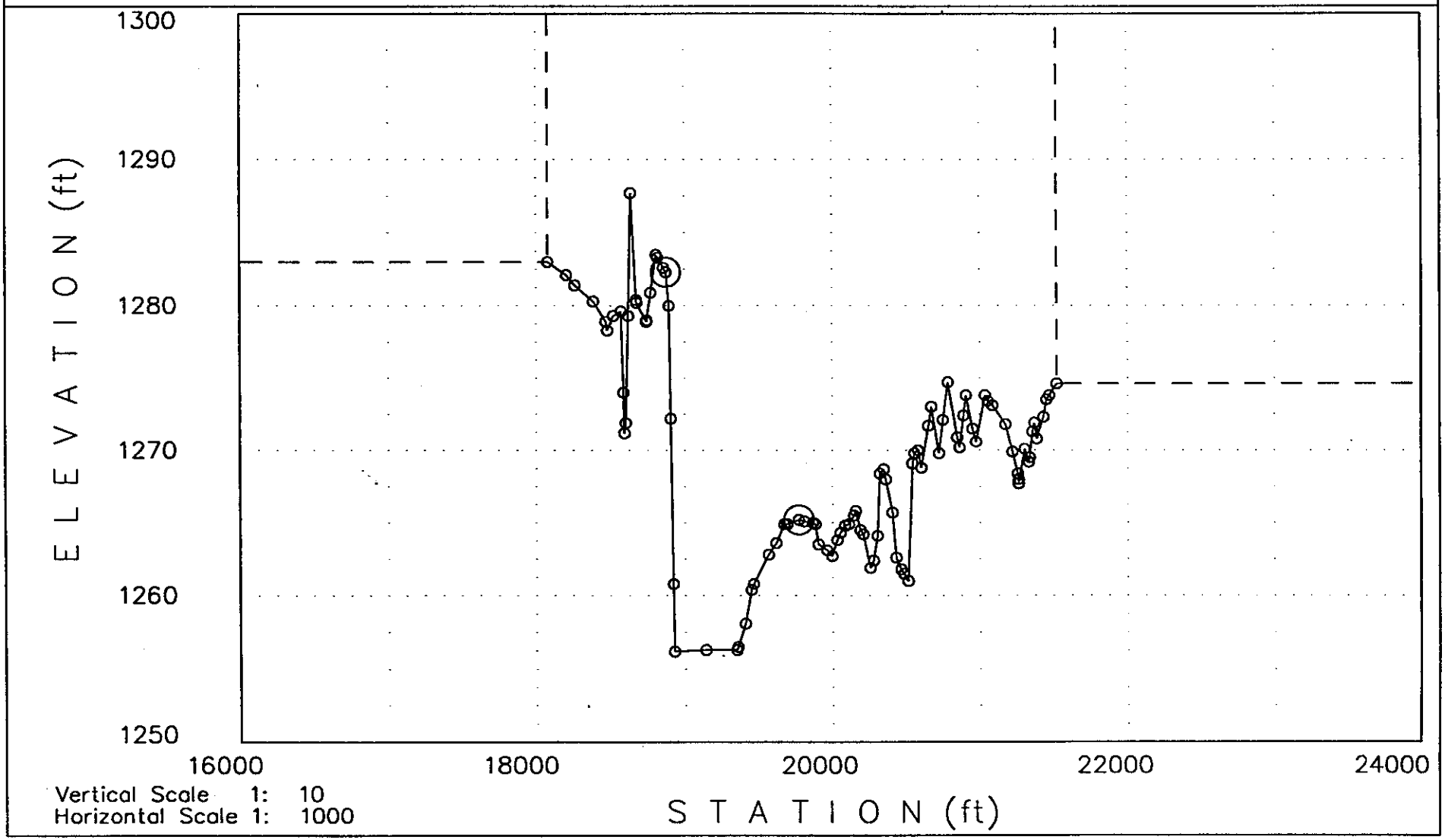
04-20-1994

<<<<<< Cross Section: 33.892: (FN = SALT.I) >>>>>>



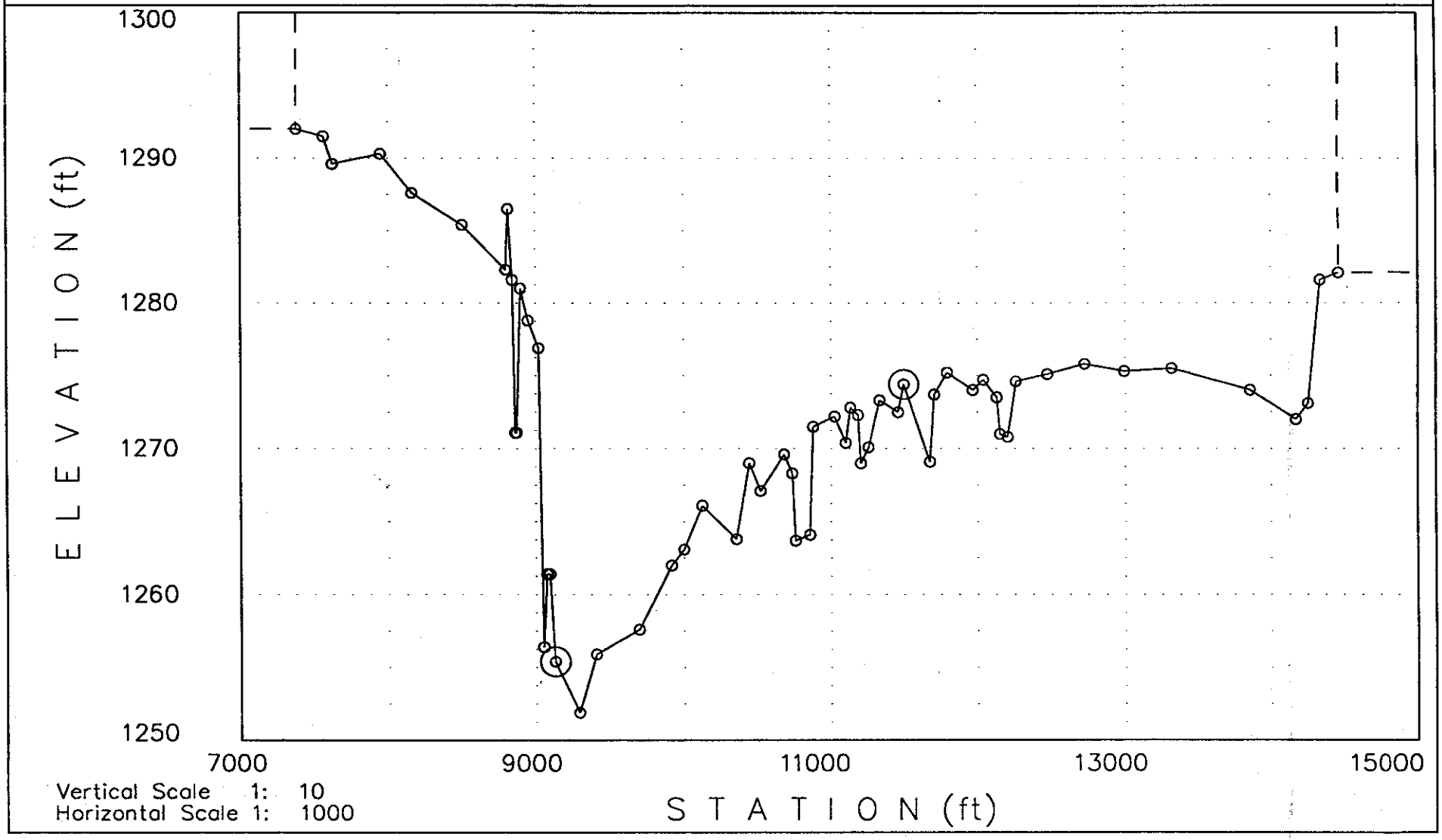
04-21-1994

<<<<<< Cross Section: 234.18: (FN = R5PRQ.DAT) >>>>>>



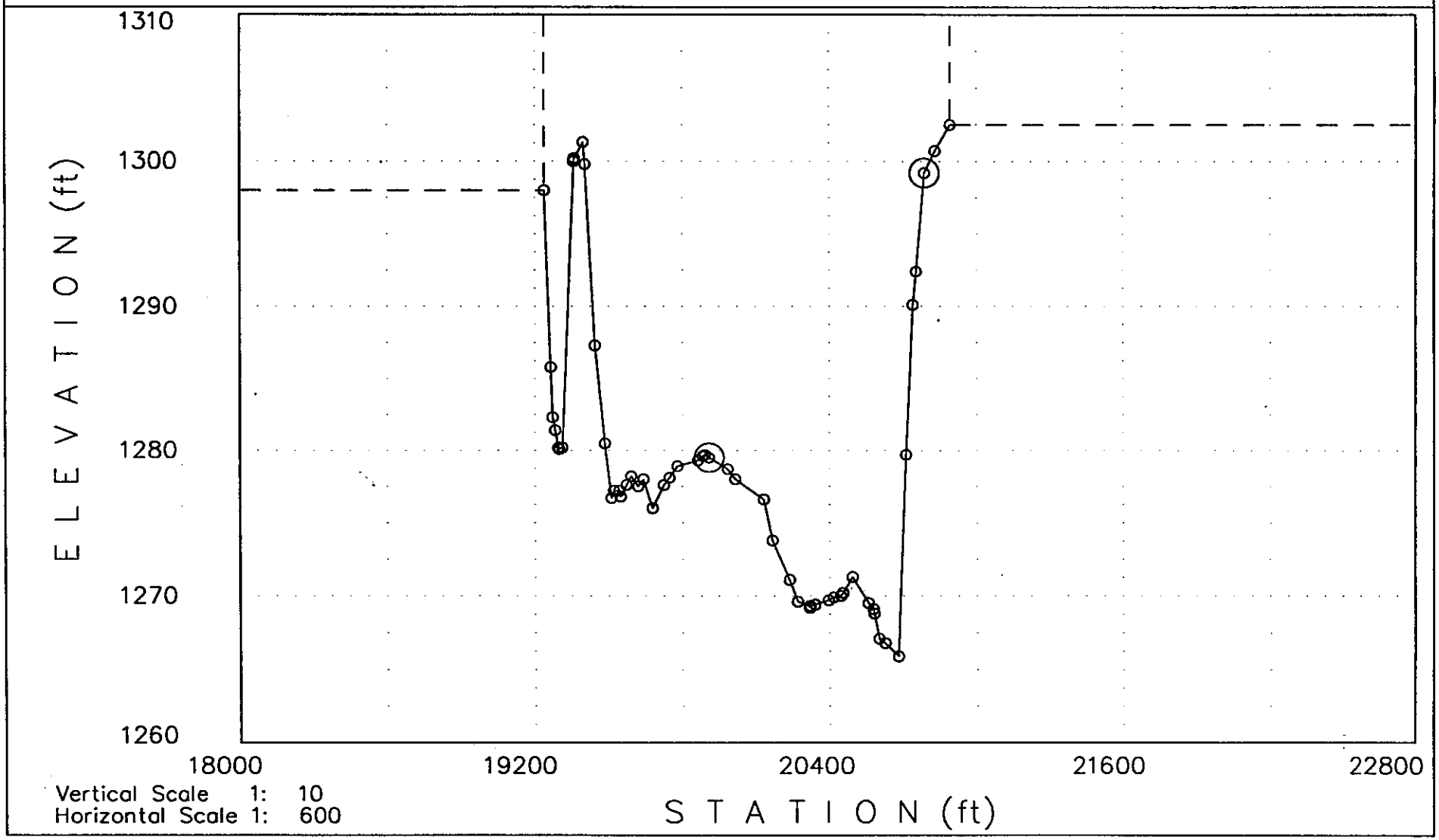
04-20-1994

<<<<<< Cross Section: 34.856: (FN = SALT.I) >>>>>>



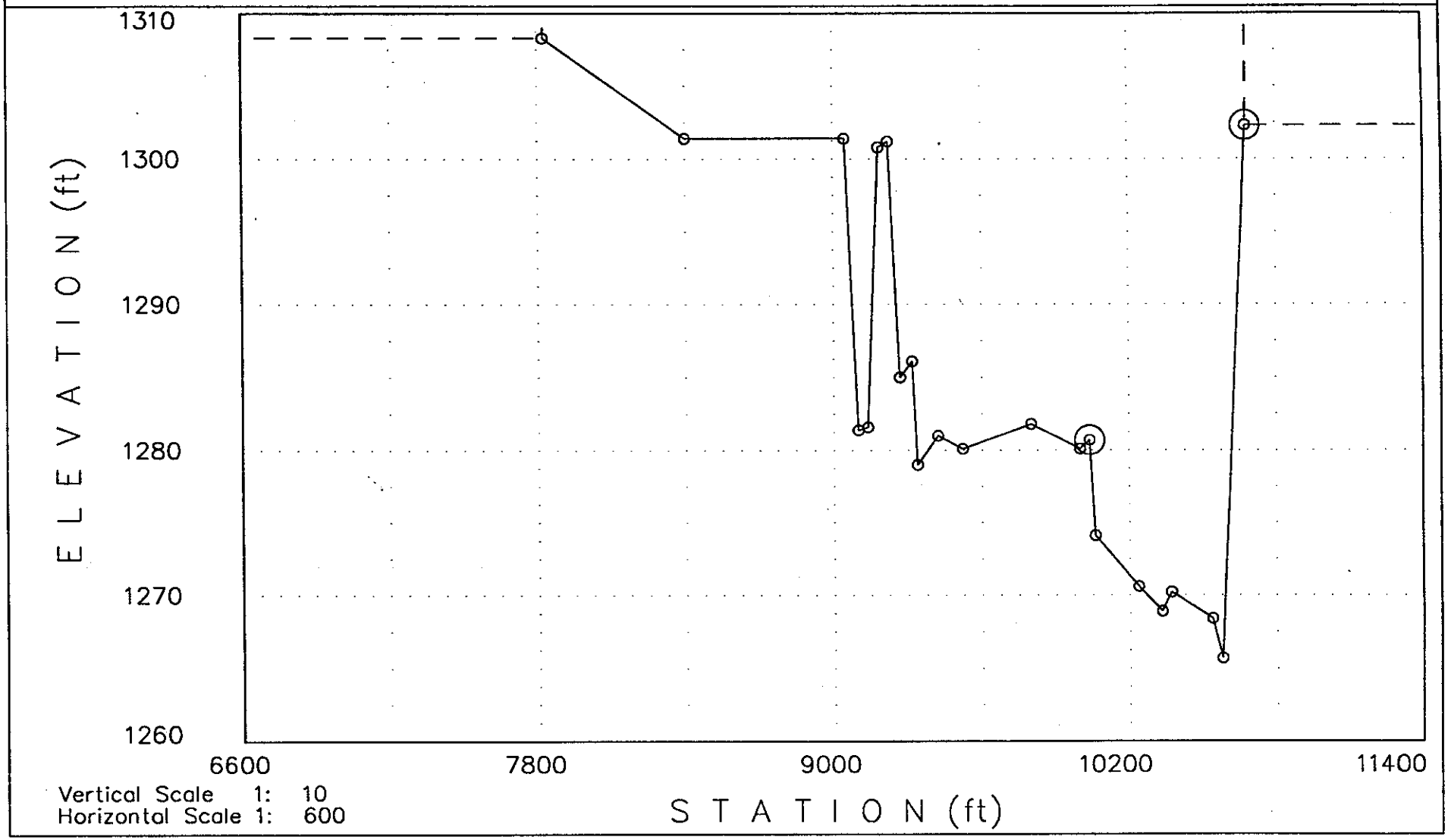
04-12-1994

<<<<<< Cross Section: 236.15: (FN = R5PRQ.DAT) >>>>>>

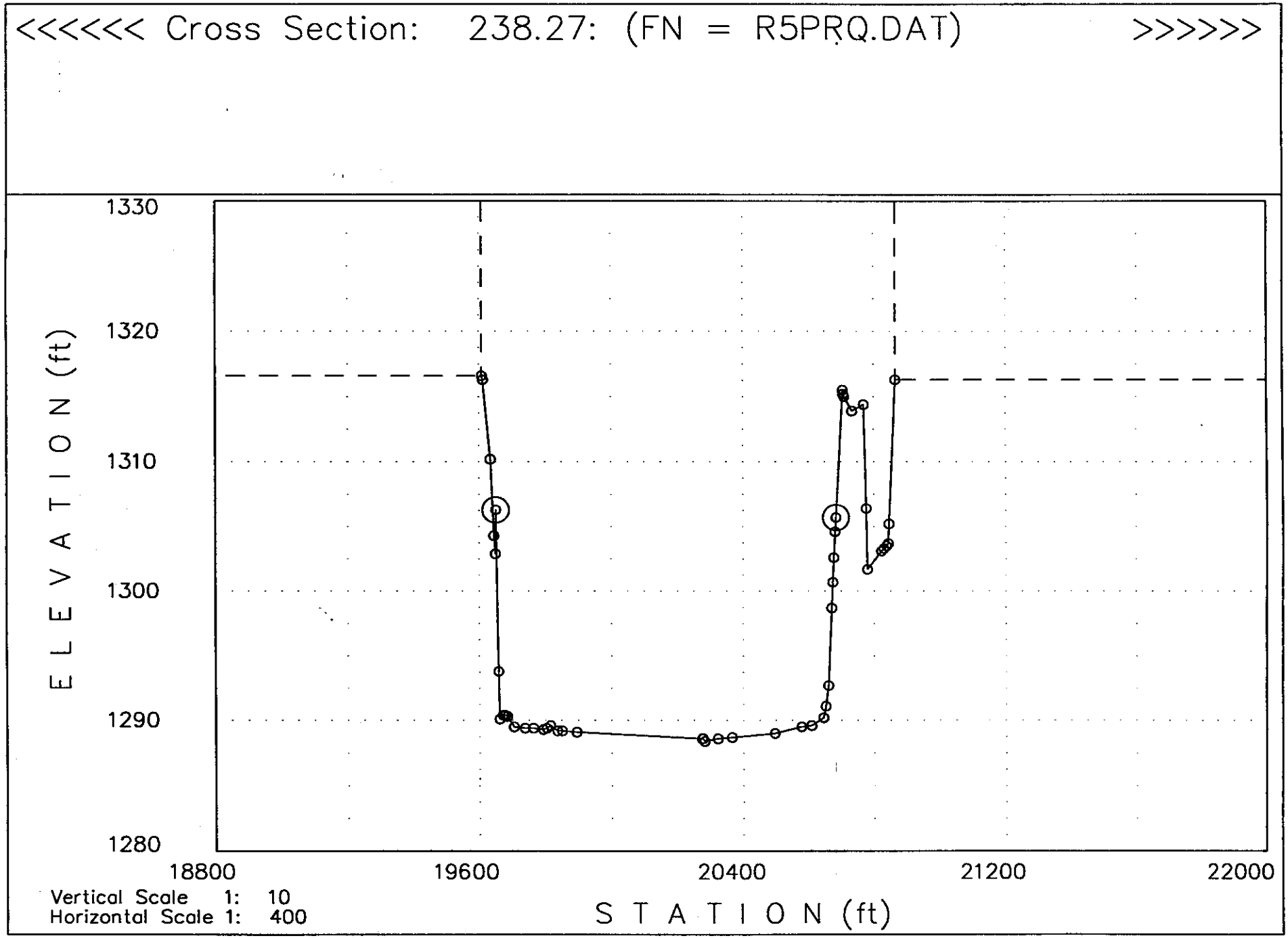


04-12-1994

<<<<<< Cross Section: 36.775: (FN = SALT.I) >>>>>>

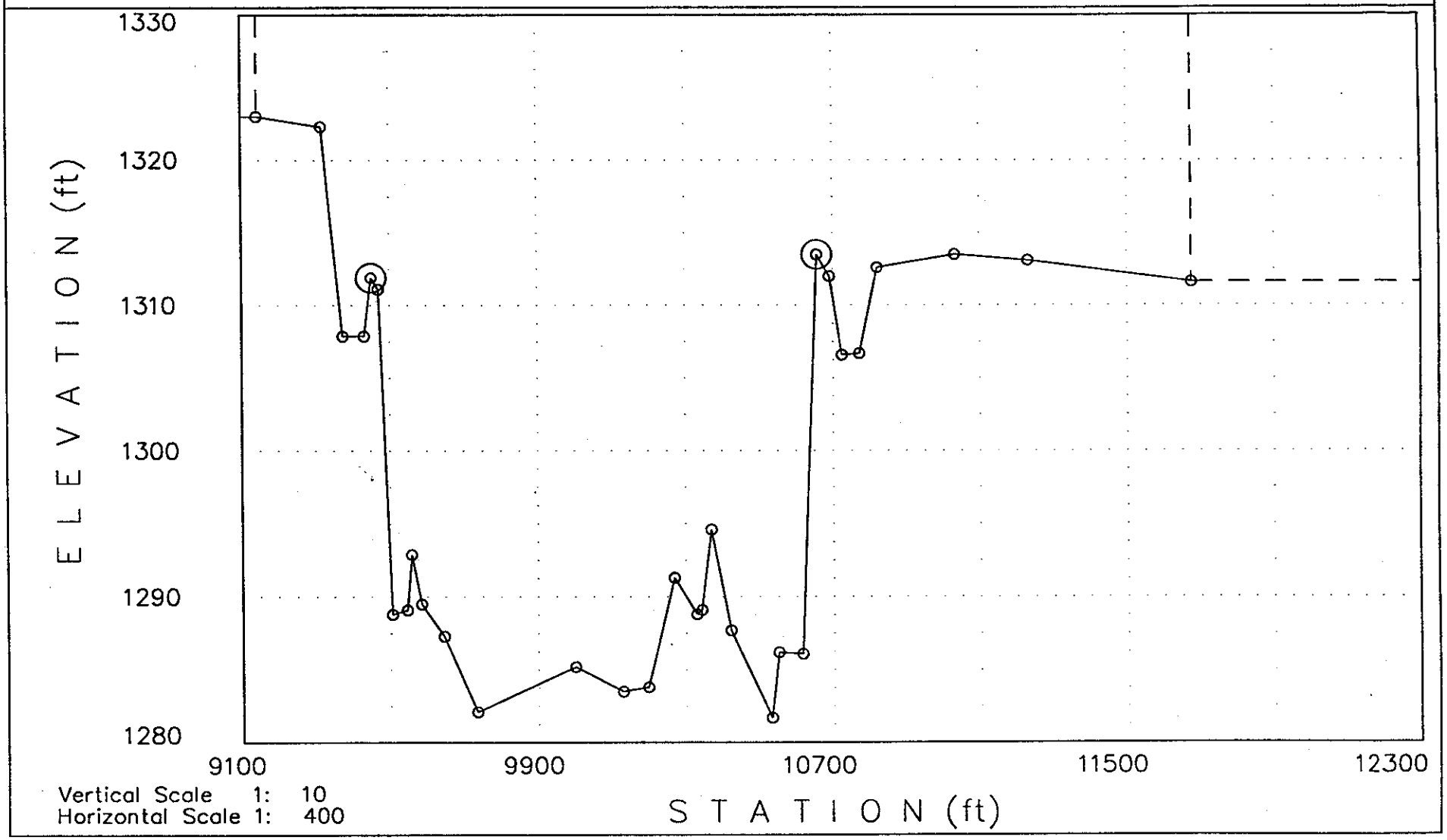


04-12-1994


<<<<<< Cross Section: 238.27: (FN = R5PRQ.DAT) >>>>>>
ELEVATION (ft)
1330
1320
1310
1300
1290
1280
18800
19600
20400
21200
22000
STATION (ft)
Vertical Scale 1: 10
Horizontal Scale 1: 400

04-20-1994

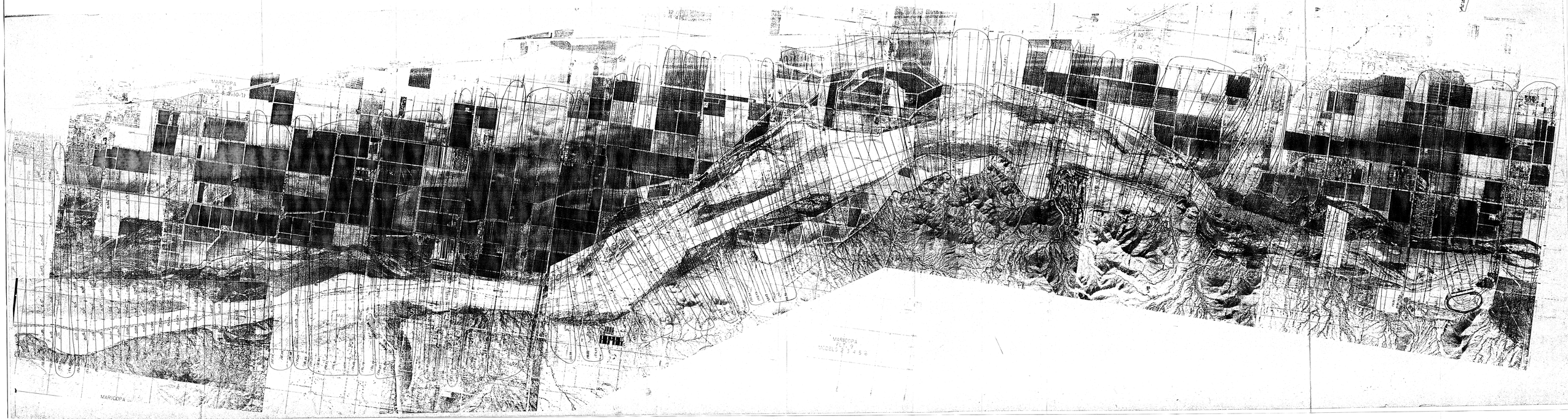
<<<<<< Cross Section: 39.098: (FN = SALT.I) >>>>>>

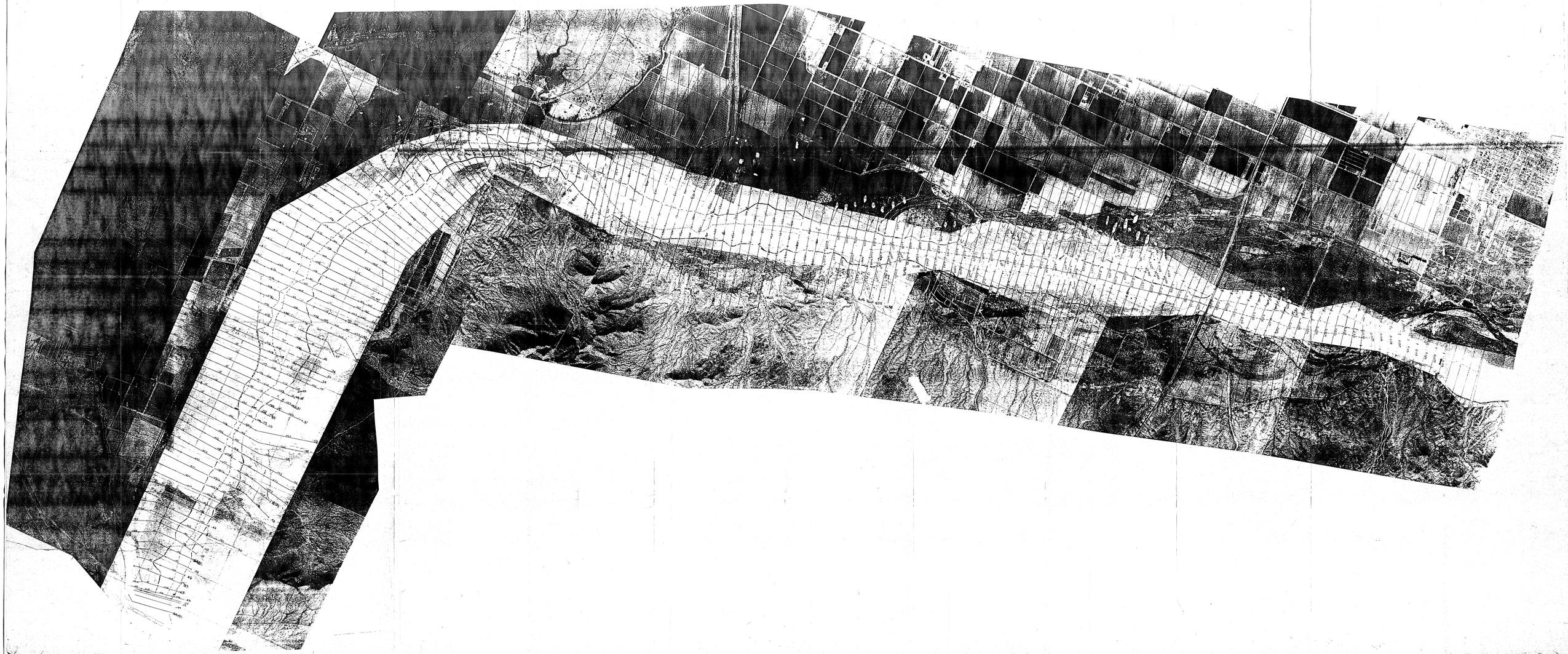


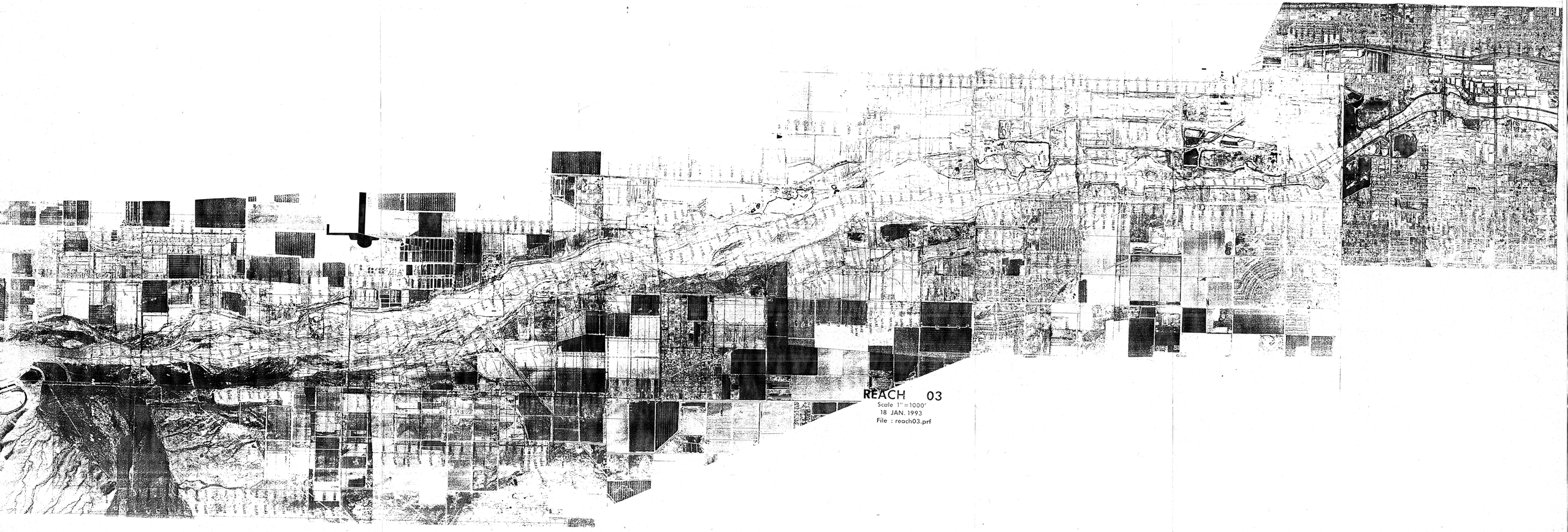
04-12-1994

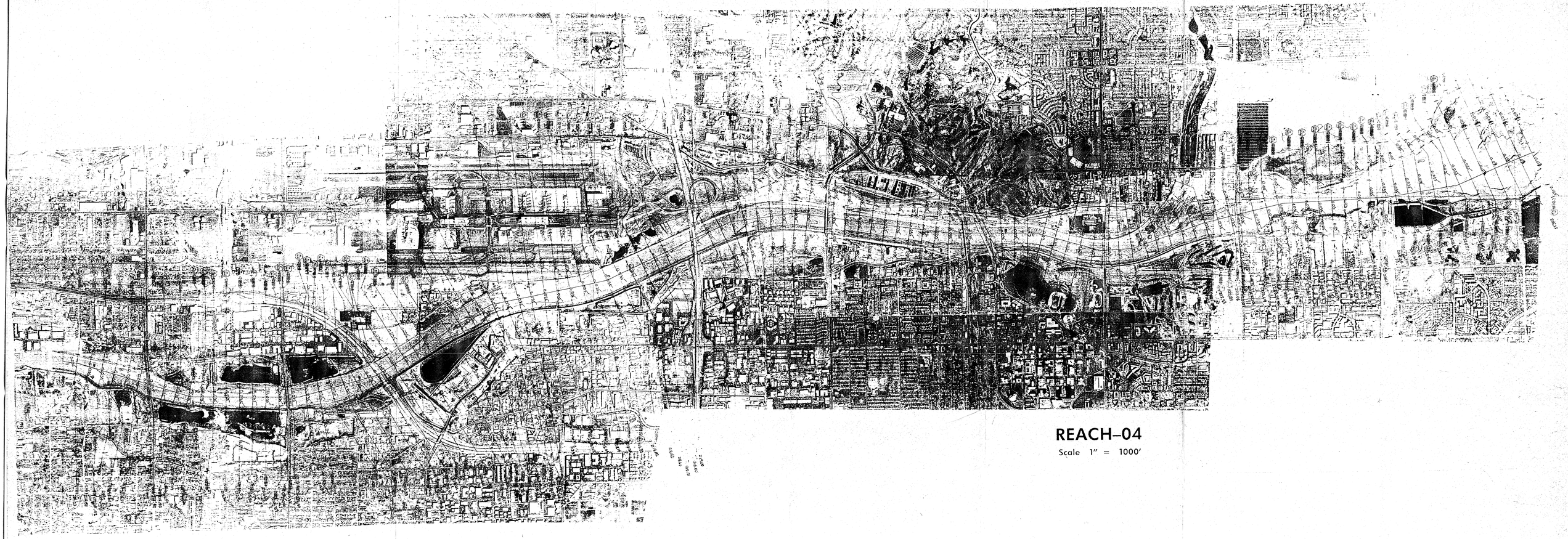
APPENDIX F

100-YEAR "n" VALUES
PLAN SHEETS
Reach 1 - Reach 5


MARICOPA




REACH 03
Scale 1" = 1000'
18 JAN. 1993
File : reach03.prf



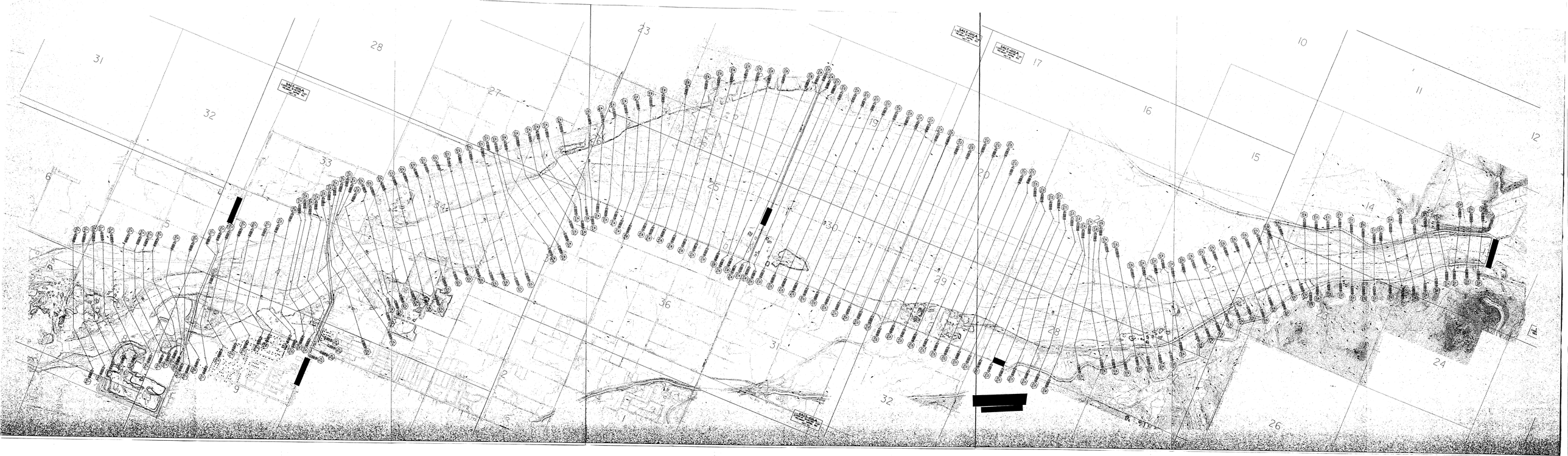
REACH–04

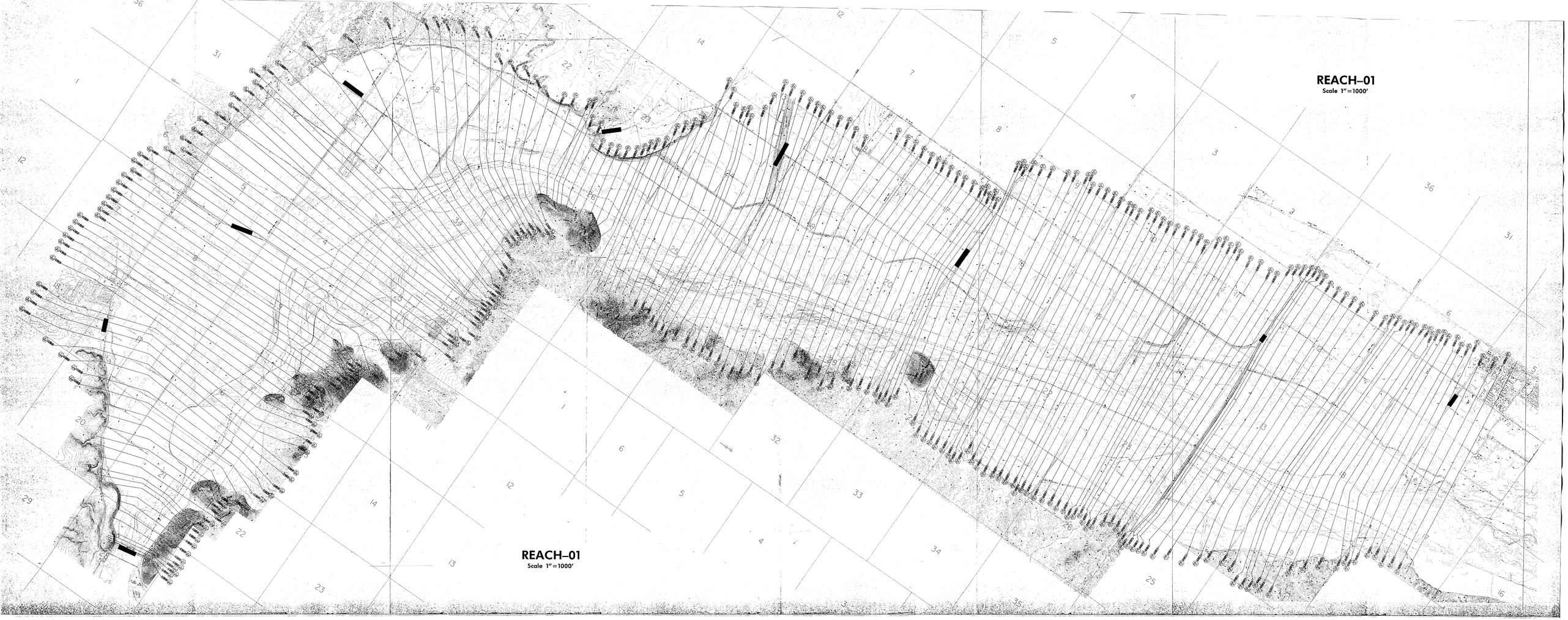
Scale 1" = 1000'

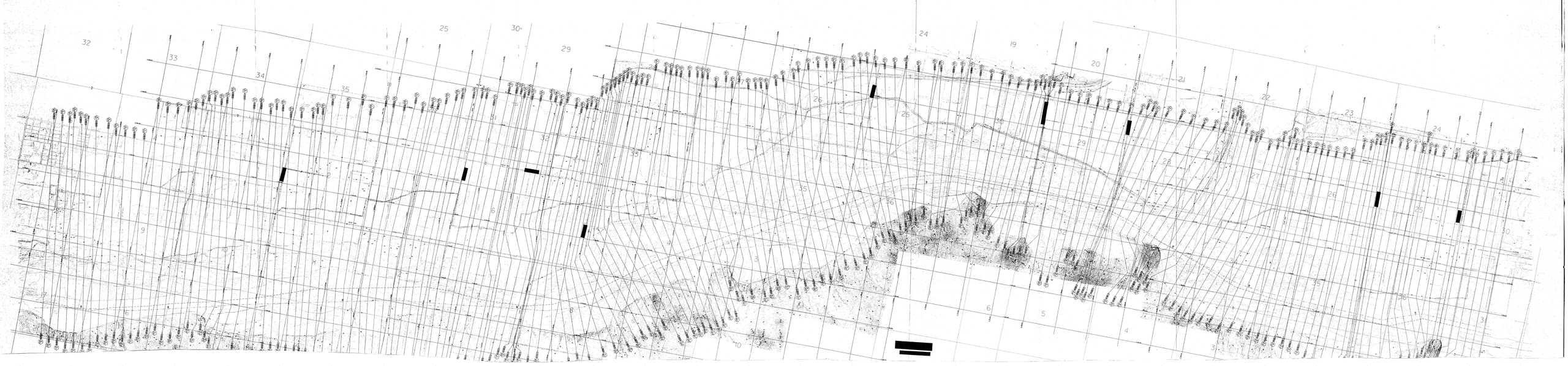
NOTE:- Since aerial is not at an exact scale, the upper half of cross-sections are inverted in relation to the aerial photo.

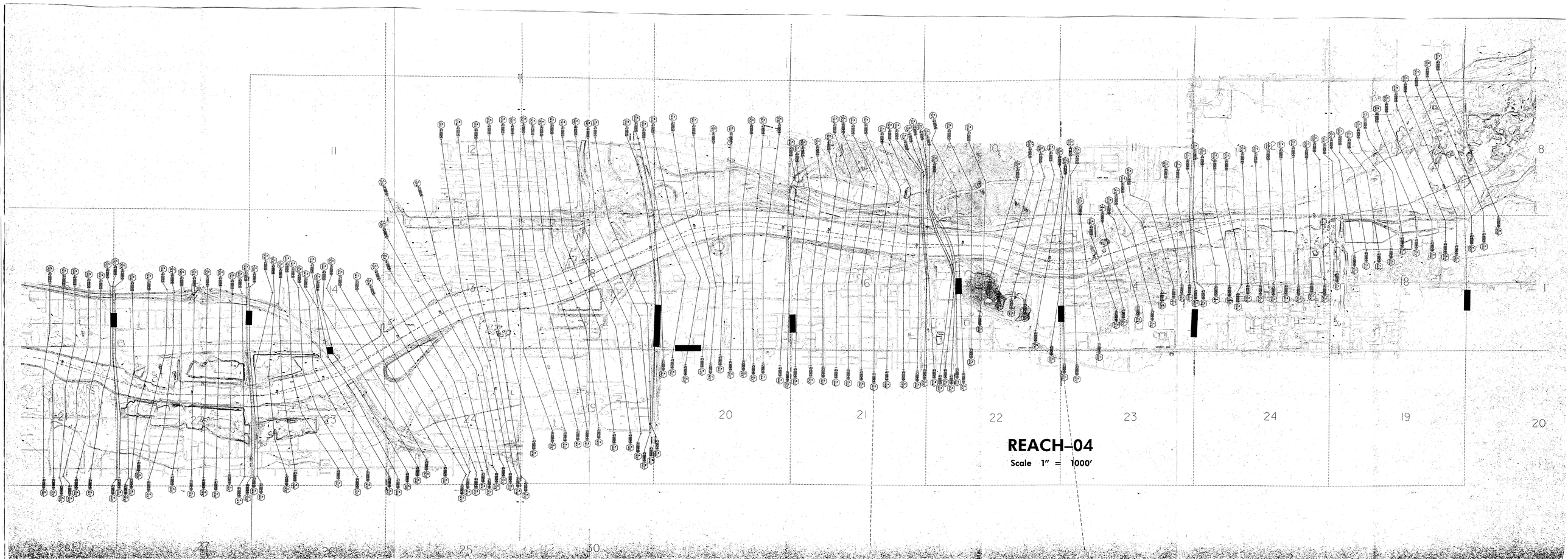
APPENDIX G

CROSS-SECTION LOCATIONS
PLAN SHEETS
Reach 1 - Reach 5


SALT-GILA
SALT-GILA
SALT-GILA
SALT-GILA
31
32
28
27
33
43
26
19
20
25
30
29
36
31
32
28
17
16
15
10
11
12
14
24
26
6
5
4
9
2
3
8
7
1
22
23
21
T.1.


REACH–01
Scale 1″=1000′
REACH–01
Scale 1″=1000′




REACH–04
Scale 1″ = 1000′